

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: P319141

Luminaire Tested: **GLEON-SA7D-760-U-T4W**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P319141  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-18)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA7D-760-U-T4W  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(7) 70 CRI, 5700K, 1200mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE IV WIDE OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 54498 lumens  
Efficiency: N/A  
Efficacy: 121.6 lumens/watt  
Luminous Opening: Rectangular (W 2' x L: 1' x H: 0')  
IES Classification: Type IV - Short  
BUG Rating: B4 - U0 - G5

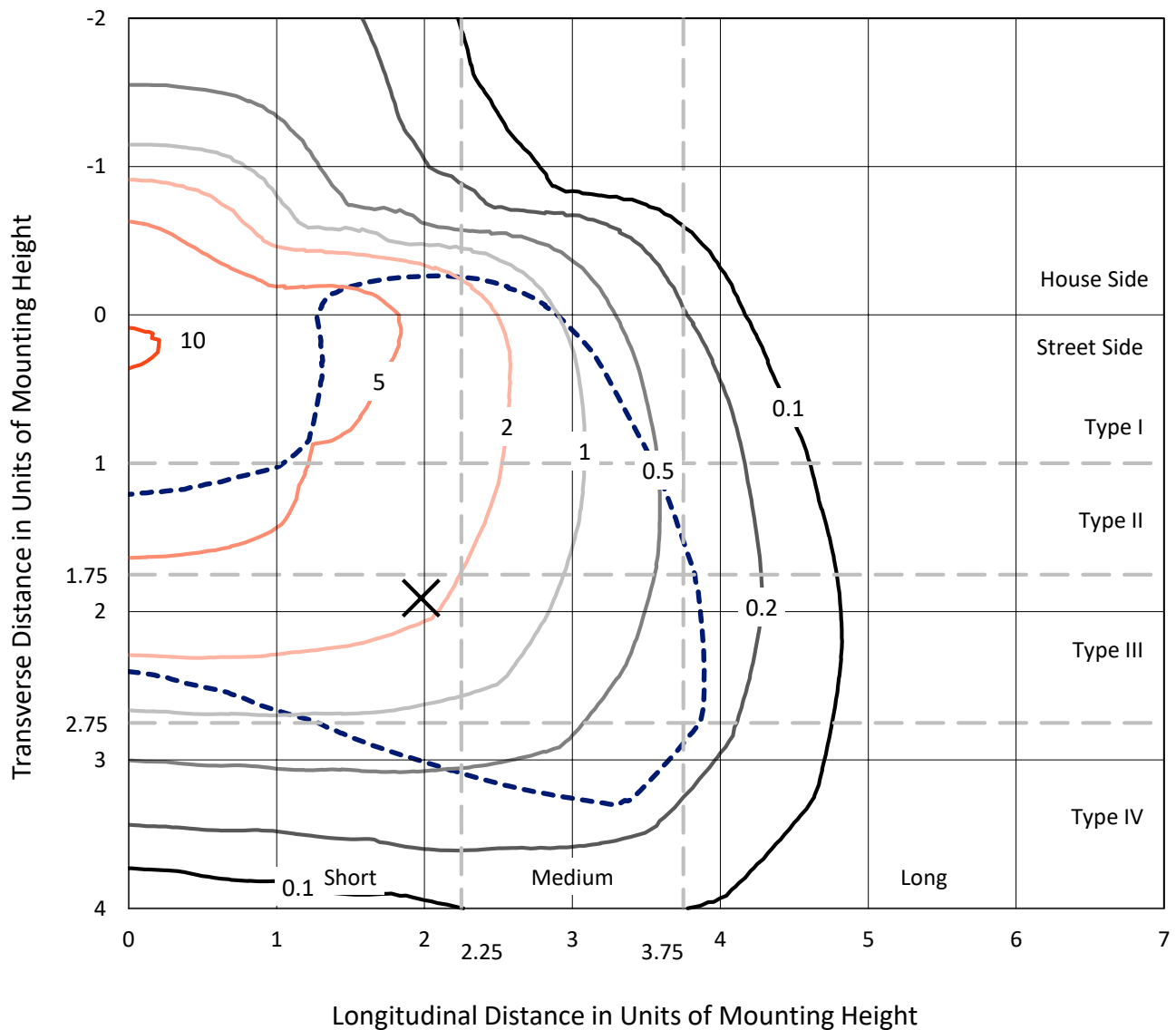
Input Watts (W): 448  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



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## Iso-Footcandle Lines of Horizontal Illumination

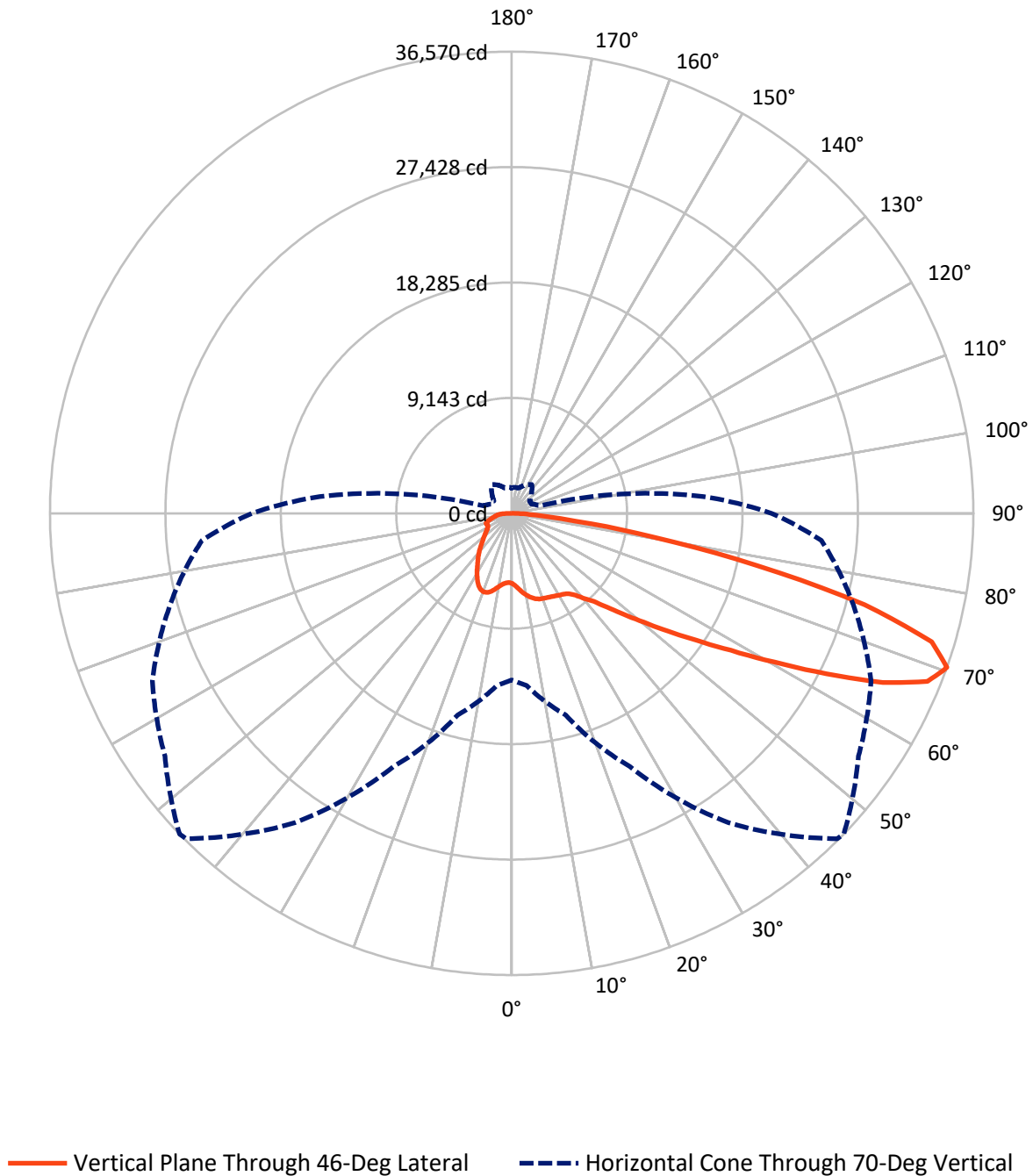
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 11.1 fc  
 Type IV - Short - N/A

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## Luminous Intensity Polar Plot



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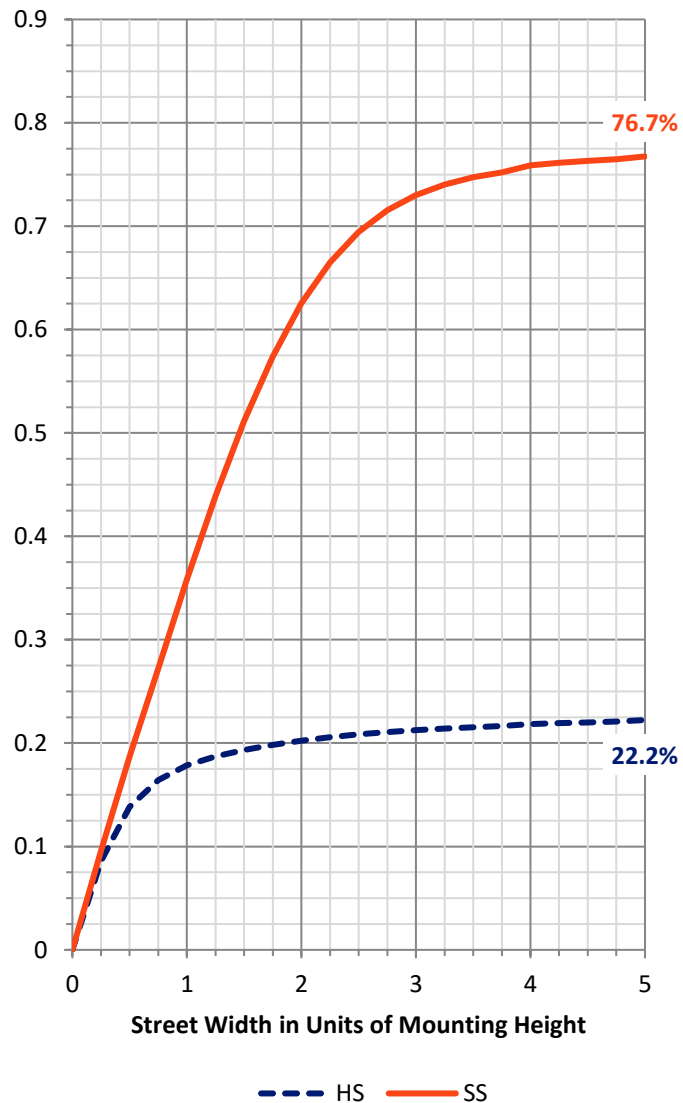
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 12490.8  | 0.0    | 12490.8 |
|                    | % Fixture | 22.9     | 0.0    | 22.9    |
| <b>Street Side</b> | Lumens    | 42007.2  | 0.0    | 42007.2 |
|                    | % Fixture | 77.1     | 0.0    | 77.1    |
| <b>Total</b>       | Lumens    | 54498.0  | 0.0    | 54498.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 566.0   | 1.0       |
| 10°-20°   | 1885.8  | 3.5       |
| 20°-30°   | 3144.3  | 5.8       |
| 30°-40°   | 4462.0  | 8.2       |
| 40°-50°   | 6563.4  | 12.0      |
| 50°-60°   | 11115.0 | 20.4      |
| 60°-70°   | 15777.6 | 29.0      |
| 70°-80°   | 9585.0  | 17.6      |
| 80°-90°   | 1398.8  | 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°    | 54498.0 | 100.0     |
| 0°-180°   | 54498.0 | 100.0     |

**Coefficient of Utilization**



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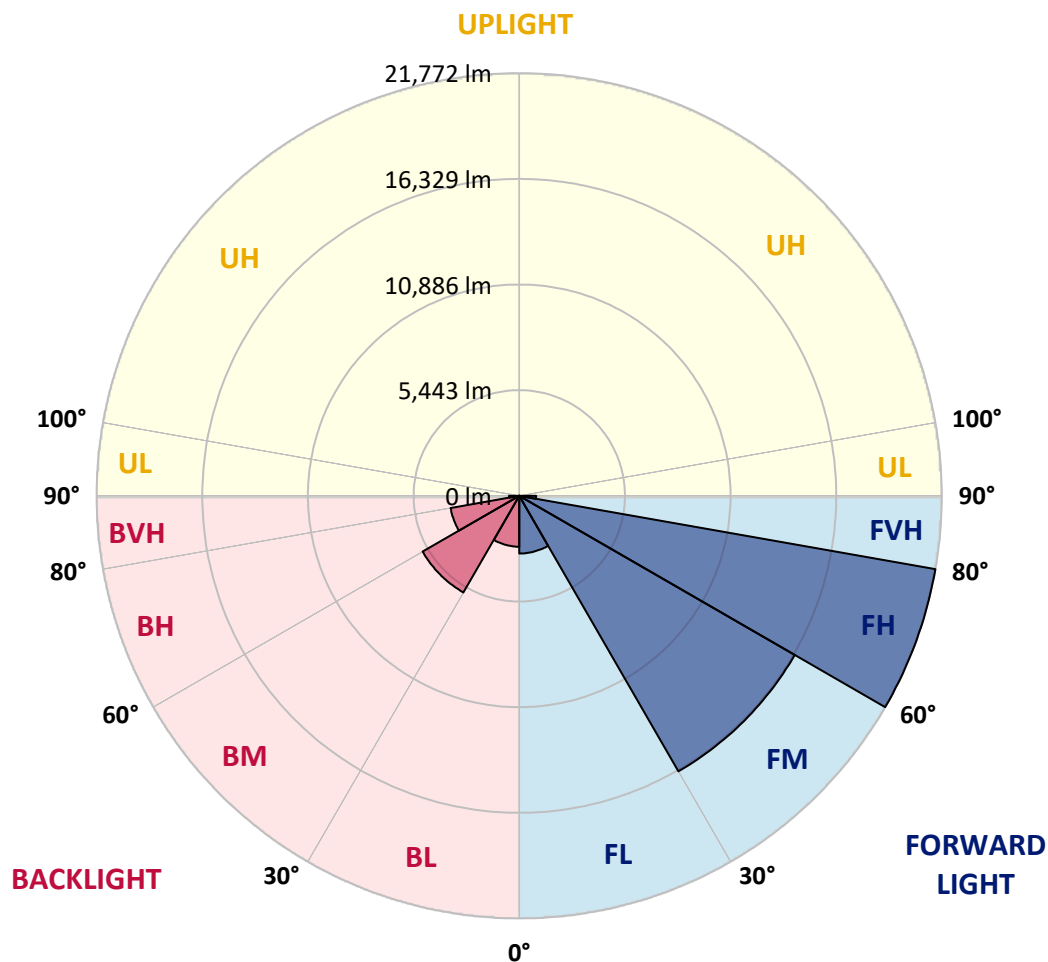
CATALOG NUMBER: GLEON-SA7D-760-U-T4W

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

| Zone |             | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|---------|-----------|-------------------------|------|---------|
|      |             |         |           | B                       | U    | G       |
| FL   | (0°-30°)    | 2973.7  | 5.5       |                         |      |         |
| FM   | (30°-60°)   | 16390.6 | 30.1      |                         |      |         |
| FH   | (60°-80°)   | 21771.6 | 39.9      |                         |      | G5      |
| FVH  | (80°-90°)   | 871.3   | 1.6       |                         |      | G5      |
| BL   | (0°-30°)    | 2622.5  | 4.8       | B4/5000                 |      |         |
| BM   | (30°-60°)   | 5749.8  | 10.6      | B4/8500                 |      |         |
| BH   | (60°-80°)   | 3591.0  | 6.6       | B4/5000                 |      | G4/5000 |
| BVH  | (80°-90°)   | 527.5   | 1.0       |                         |      | G4/750  |
| UL   | (90°-100°)  | 0.0     | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0     | 0.0       |                         | U0/0 |         |

**BUG Rating: B4-U0-G5**

Type IV Short





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 45°     | 46°     | 55°     | 65°     | 75°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 5552.3  | 5552.3  | 5552.3  | 5552.3  | 5552.3  | 5552.3  | 5552.3  | 5552.3  | 5552.3  | 5552.3  | 5552.3  |
| 2.5°  | 5830.2  | 5833.9  | 5841.4  | 5822.7  | 5770.5  | 5755.6  | 5750.0  | 5695.9  | 5660.5  | 5608.2  | 5563.5  |
| 5°    | 6296.4  | 6300.2  | 6289.0  | 6236.8  | 6121.1  | 6035.3  | 6027.9  | 5904.8  | 5792.9  | 5673.5  | 5584.0  |
| 7.5°  | 6783.2  | 6788.8  | 6753.4  | 6654.5  | 6492.3  | 6343.1  | 6333.7  | 6165.9  | 5996.2  | 5815.3  | 5681.0  |
| 10°   | 7214.0  | 7191.7  | 7133.8  | 6995.8  | 6803.7  | 6621.0  | 6613.5  | 6438.2  | 6242.4  | 6024.1  | 5845.1  |
| 12.5° | 7501.3  | 7482.6  | 7408.0  | 7240.2  | 7029.4  | 6861.6  | 6846.6  | 6684.4  | 6494.1  | 6255.4  | 6040.9  |
| 15°   | 7659.8  | 7672.9  | 7572.1  | 7381.9  | 7176.7  | 7035.0  | 7021.9  | 6906.3  | 6736.6  | 6496.0  | 6249.8  |
| 17.5° | 7680.3  | 7691.5  | 7594.5  | 7406.1  | 7238.3  | 7141.3  | 7135.7  | 7059.2  | 6936.2  | 6704.9  | 6447.5  |
| 20°   | 7560.9  | 7568.4  | 7488.2  | 7333.4  | 7223.4  | 7193.5  | 7191.7  | 7158.1  | 7066.7  | 6861.6  | 6611.6  |
| 22.5° | 7387.5  | 7393.1  | 7335.3  | 7223.4  | 7186.1  | 7232.7  | 7245.8  | 7232.7  | 7167.4  | 6975.3  | 6740.3  |
| 25°   | 7344.6  | 7340.9  | 7281.2  | 7167.4  | 7199.1  | 7298.0  | 7314.8  | 7320.4  | 7275.6  | 7107.7  | 6904.4  |
| 27.5° | 7551.6  | 7538.6  | 7424.8  | 7242.0  | 7262.5  | 7381.9  | 7404.3  | 7458.4  | 7430.4  | 7283.1  | 7091.0  |
| 30°   | 8150.3  | 8127.9  | 7894.8  | 7525.5  | 7424.8  | 7486.3  | 7514.3  | 7600.1  | 7605.7  | 7482.6  | 7339.0  |
| 32.5° | 9161.2  | 9133.2  | 8715.4  | 8055.2  | 7699.0  | 7592.7  | 7618.8  | 7747.5  | 7816.5  | 7721.3  | 7566.5  |
| 35°   | 10438.7 | 10407.0 | 9858.7  | 8956.0  | 8157.8  | 7795.9  | 7814.6  | 7917.2  | 8055.2  | 7920.9  | 7715.7  |
| 37.5° | 11770.4 | 11693.9 | 11166.1 | 10015.4 | 8887.0  | 8230.5  | 8230.5  | 8243.6  | 8308.8  | 8029.1  | 7891.1  |
| 40°   | 13094.6 | 13018.1 | 12540.7 | 11261.2 | 9830.7  | 8915.0  | 8872.1  | 8583.0  | 8530.8  | 8290.2  | 8243.6  |
| 42.5° | 14325.5 | 14303.1 | 14021.5 | 12669.3 | 10938.6 | 9588.3  | 9528.6  | 9038.1  | 9049.3  | 8900.1  | 8901.9  |
| 45°   | 15634.8 | 15634.8 | 15405.4 | 14090.5 | 12229.2 | 10670.0 | 10610.3 | 9888.5  | 10000.4 | 9931.4  | 10097.4 |
| 47.5° | 16703.5 | 16737.0 | 16705.3 | 15571.4 | 13730.6 | 12044.5 | 11936.4 | 11067.3 | 11380.6 | 11617.5 | 12100.5 |
| 50°   | 17794.5 | 17846.7 | 17852.3 | 17195.8 | 15545.3 | 13678.3 | 13555.2 | 12632.0 | 13331.4 | 14010.3 | 14959.6 |
| 52.5° | 19378.0 | 19495.5 | 19027.3 | 18816.6 | 17768.4 | 15618.0 | 15496.8 | 14644.4 | 15812.0 | 16765.0 | 18400.7 |
| 55°   | 20845.8 | 20743.2 | 20409.3 | 20539.9 | 20148.2 | 17826.2 | 17734.8 | 16987.0 | 18576.0 | 19814.4 | 21938.7 |
| 57.5° | 21640.3 | 21632.8 | 21968.5 | 22528.0 | 22714.5 | 20549.2 | 20472.7 | 19745.4 | 21692.5 | 22623.2 | 25260.4 |
| 60°   | 22572.8 | 22585.9 | 23417.7 | 24687.8 | 25456.2 | 23939.9 | 23906.3 | 23354.3 | 24719.5 | 25245.4 | 27865.8 |
| 62.5° | 22703.4 | 22938.4 | 24370.7 | 26556.6 | 28022.5 | 27901.3 | 27975.9 | 26605.1 | 27427.6 | 27338.0 | 29811.1 |
| 65°   | 21202.0 | 21511.6 | 24104.0 | 27121.7 | 30573.9 | 32233.8 | 32302.8 | 29874.5 | 29563.0 | 29126.6 | 30506.8 |
| 67.5° | 18124.6 | 18583.4 | 21399.7 | 25892.6 | 31415.0 | 35436.1 | 35533.1 | 32409.1 | 31334.8 | 29732.8 | 28831.9 |
| 70°   | 13189.7 | 13698.9 | 16533.7 | 22114.0 | 29915.5 | 36460.0 | 36570.1 | 33530.0 | 31402.0 | 28007.6 | 24613.2 |
| 72.5° | 7967.5  | 8366.7  | 10703.6 | 16280.1 | 25249.2 | 34595.0 | 34790.8 | 32108.8 | 28669.7 | 23723.5 | 18175.0 |
| 75°   | 3498.8  | 3760.0  | 5175.5  | 9381.2  | 18076.1 | 28623.1 | 28867.4 | 27483.5 | 23294.6 | 17240.6 | 10742.7 |
| 77.5° | 1490.2  | 1564.8  | 2122.4  | 4075.2  | 10218.7 | 19558.9 | 19894.6 | 20081.1 | 15804.5 | 9381.2  | 4539.6  |
| 80°   | 928.8   | 958.6   | 1201.1  | 1844.5  | 4782.0  | 10985.2 | 11347.0 | 11815.1 | 7848.2  | 3448.5  | 1585.3  |
| 82.5° | 565.1   | 598.7   | 798.2   | 1115.3  | 2489.9  | 4979.7  | 5153.2  | 5483.3  | 3045.6  | 1490.2  | 820.6   |
| 85°   | 339.4   | 363.7   | 488.6   | 705.0   | 1417.4  | 1958.3  | 1956.4  | 2163.5  | 1434.2  | 958.6   | 432.7   |
| 87.5° | 162.3   | 180.9   | 261.1   | 365.6   | 714.3   | 734.8   | 688.2   | 779.6   | 871.0   | 628.5   | 218.2   |
| 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: P319141

CATALOG NUMBER: GLEON-SA7D-760-U-T4W

**CANDELA DISTRIBUTION (continued):**

|       | 90°     | 95°     | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|---------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 5552.3  | 5552.3  | 5552.3 | 5552.3 | 5552.3 | 5552.3 | 5552.3 | 5552.3 | 5552.3 | 5552.3 | 5552.3 |
| 2.5°  | 5548.5  | 5541.1  | 5516.8 | 5498.2 | 5494.5 | 5483.3 | 5473.9 | 5479.5 | 5487.0 | 5488.9 | 5488.9 |
| 5°    | 5546.7  | 5526.2  | 5494.5 | 5481.4 | 5498.2 | 5520.6 | 5548.5 | 5585.9 | 5608.2 | 5625.0 | 5636.2 |
| 7.5°  | 5636.2  | 5597.0  | 5561.6 | 5554.1 | 5587.7 | 5647.4 | 5710.8 | 5789.1 | 5843.2 | 5880.5 | 5888.0 |
| 10°   | 5785.4  | 5736.9  | 5701.5 | 5708.9 | 5768.6 | 5854.4 | 5943.9 | 6044.7 | 6126.7 | 6177.1 | 6180.8 |
| 12.5° | 5957.0  | 5910.4  | 5876.8 | 5908.5 | 6007.4 | 6111.8 | 6205.1 | 6292.7 | 6367.3 | 6417.7 | 6417.7 |
| 15°   | 6154.7  | 6121.1  | 6082.0 | 6154.7 | 6289.0 | 6382.2 | 6421.4 | 6464.3 | 6505.3 | 6542.6 | 6535.2 |
| 17.5° | 6344.9  | 6313.2  | 6292.7 | 6378.5 | 6518.4 | 6561.3 | 6535.2 | 6503.5 | 6503.5 | 6524.0 | 6527.7 |
| 20°   | 6509.1  | 6481.1  | 6494.1 | 6578.1 | 6650.8 | 6606.0 | 6509.1 | 6408.3 | 6367.3 | 6378.5 | 6389.7 |
| 22.5° | 6652.7  | 6639.6  | 6678.8 | 6717.9 | 6665.7 | 6509.1 | 6330.0 | 6193.9 | 6143.5 | 6139.8 | 6143.5 |
| 25°   | 6820.5  | 6818.7  | 6867.1 | 6796.3 | 6565.0 | 6275.9 | 6035.3 | 5902.9 | 5874.9 | 5897.3 | 5934.6 |
| 27.5° | 7029.4  | 7049.9  | 7074.2 | 6814.9 | 6359.8 | 5923.4 | 5679.1 | 5587.7 | 5615.7 | 5669.8 | 5705.2 |
| 30°   | 7296.1  | 7352.1  | 7299.8 | 6768.3 | 6065.2 | 5520.6 | 5287.4 | 5261.3 | 5337.8 | 5414.3 | 5451.6 |
| 32.5° | 7555.4  | 7643.0  | 7516.2 | 6647.1 | 5684.7 | 5093.5 | 4912.6 | 4905.1 | 4998.4 | 5073.0 | 5125.2 |
| 35°   | 7764.2  | 7937.7  | 7678.4 | 6406.5 | 5244.5 | 4699.9 | 4567.5 | 4517.2 | 4550.7 | 4638.4 | 4698.1 |
| 37.5° | 8036.5  | 8325.6  | 7790.3 | 6039.1 | 4767.1 | 4375.4 | 4220.6 | 4105.0 | 4075.2 | 4110.6 | 4140.4 |
| 40°   | 8534.5  | 8916.8  | 7842.6 | 5526.2 | 4300.8 | 4050.9 | 3894.2 | 3724.5 | 3607.0 | 3521.2 | 3523.1 |
| 42.5° | 9347.7  | 9687.1  | 7809.0 | 4903.2 | 3870.0 | 3733.8 | 3556.7 | 3360.8 | 3170.6 | 2976.6 | 2961.7 |
| 45°   | 10668.1 | 10832.3 | 7708.3 | 4243.0 | 3491.4 | 3401.9 | 3235.9 | 3040.0 | 2786.4 | 2566.3 | 2545.8 |
| 47.5° | 12781.2 | 12417.6 | 7551.6 | 3666.7 | 3157.5 | 3120.2 | 2967.3 | 2741.6 | 2473.1 | 2295.9 | 2281.0 |
| 50°   | 15662.8 | 14706.0 | 7475.2 | 3207.9 | 2862.9 | 2874.1 | 2749.1 | 2510.4 | 2256.7 | 2126.2 | 2111.2 |
| 52.5° | 19109.4 | 17371.2 | 7622.5 | 2853.5 | 2626.0 | 2665.2 | 2571.9 | 2348.1 | 2135.5 | 2032.9 | 2018.0 |
| 55°   | 22684.7 | 20131.4 | 7781.0 | 2596.2 | 2402.2 | 2478.7 | 2447.0 | 2262.3 | 2070.2 | 1975.1 | 1962.0 |
| 57.5° | 25745.3 | 22192.3 | 7464.0 | 2387.3 | 2202.6 | 2322.0 | 2350.0 | 2208.2 | 2036.6 | 1950.9 | 1935.9 |
| 60°   | 27671.9 | 23022.3 | 6632.1 | 2191.4 | 2044.1 | 2197.0 | 2294.0 | 2193.3 | 2049.7 | 2042.2 | 2031.0 |
| 62.5° | 28585.8 | 22949.5 | 5384.4 | 2036.6 | 1945.3 | 2143.0 | 2335.1 | 2277.2 | 2198.9 | 2266.0 | 2271.6 |
| 65°   | 28175.4 | 21852.9 | 4009.9 | 1934.1 | 1874.4 | 2163.5 | 2458.1 | 2435.8 | 2241.8 | 2308.9 | 2318.3 |
| 67.5° | 25474.8 | 19236.2 | 2969.2 | 1844.5 | 1796.1 | 2221.3 | 2682.0 | 2488.0 | 2157.9 | 2206.4 | 2176.5 |
| 70°   | 20590.2 | 15250.6 | 2290.3 | 1743.8 | 1715.9 | 2213.8 | 2782.7 | 2456.3 | 2066.5 | 2077.7 | 1997.5 |
| 72.5° | 14198.7 | 10399.6 | 1863.2 | 1650.6 | 1600.2 | 2018.0 | 2711.8 | 2377.9 | 1990.0 | 1904.2 | 1797.9 |
| 75°   | 7721.3  | 5582.1  | 1583.4 | 1553.6 | 1396.9 | 1771.8 | 2581.2 | 2322.0 | 1921.0 | 1807.2 | 1747.6 |
| 77.5° | 3038.2  | 2316.4  | 1374.5 | 1421.2 | 1221.6 | 1564.8 | 2435.8 | 2215.7 | 1825.9 | 1676.7 | 1646.8 |
| 80°   | 1240.3  | 1182.4  | 1139.6 | 1229.1 | 1050.0 | 1369.0 | 2260.5 | 2090.7 | 1712.1 | 1555.5 | 1495.8 |
| 82.5° | 703.1   | 734.8   | 885.9  | 969.8  | 852.3  | 1260.8 | 2176.5 | 1990.0 | 1576.0 | 1393.2 | 1322.3 |
| 85°   | 360.0   | 430.8   | 617.3  | 695.7  | 626.7  | 1072.4 | 2004.9 | 1742.0 | 1264.5 | 1066.8 | 1072.4 |
| 87.5° | 173.5   | 240.6   | 389.8  | 436.4  | 406.6  | 775.9  | 1497.6 | 1262.6 | 984.8  | 779.6  | 755.3  |
| 90°   | 0.0     | 0.0     | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

LM-79-2008: Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Report Prepared for

Cooper Lighting Solutions

McGRAW-EDISON

Report Number: SP1-1908-441-9-R4

Test Date: 10/23/2019

Luminaire Tested: SA1C-760-U-5WQ

Data in this report applies to families of products SA1C-760-U-5WQ .

### Test Information

Test Method: LM-79-2008  
 Report Number: SP1-1908-441-9-R4  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry:  $4\pi$   
 Issue Date: 10/28/2024  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: MCGRAW-EDISON  
 Catalog Number: **SA1C-760-U-5WQ**  
 Description: MCGRAW EDISON ROADWAY AND AREA LUMINAIRE

\*\*\*THIS IS A REVISION OF SP1-1908-441-4-R3. TO UPDATE THE CATALOG INFORMATION.\*\*\*TESTED IN SITU. ROADWAY AND AREA LUMINAIRE. (1) 70 CRI, 5000K, 1050MA LIGHTSQUARE WITH 16 LEDS AND TYPE V WIDE OPTICS.

### Spectral Parameters

|                           |        |           |      |      |       |
|---------------------------|--------|-----------|------|------|-------|
| CCT (K):                  | 5474   | CRI (Ra): | 71.7 |      |       |
| CIE u':                   | 0.2052 | R1:       | 70.6 | R9:  | -27.1 |
| CIE v':                   | 0.4804 | R2:       | 74.6 | R10: | 40.8  |
| Duv:                      | 0.0025 | R3:       | 78.3 | R11: | 74.6  |
| CIE x:                    | 0.3330 | R4:       | 73.8 | R12: | 50.4  |
| CIE y:                    | 0.3466 | R5:       | 72.4 | R13: | 70.0  |
| CIE z:                    | 0.3204 | R6:       | 67.5 | R14: | 87.8  |
| Peak Wavelength (nm):     | 442    | R7:       | 77.5 |      |       |
| Dominant Wavelength (nm): | 554    | R8:       | 58.9 |      |       |
| Purity:                   | 4.1    |           |      |      |       |
| Rf:                       | 72.1   |           |      |      |       |
| Rg:                       | 97.2   |           |      |      |       |



### Test Conditions

Stabilization Time: 240M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 24.6/31%  
 Sphere Temperature (°C): 25.9

REPORT NUMBER: SP1-1908-441-9-R4

| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | IN0058                | 6/28/2019        | 12/28/2019           |
| Power Meter                    | IN0071                | 12/5/2018        | 12/5/2019            |
| AC Power Source                | IN0063                | 12/5/2018        | 12/5/2019            |
| DC Power Source                | IN0208                | 12/5/2018        | 12/5/2019            |
| Sphere Thermometer             | IN0085                | 12/5/2018        | 12/5/2019            |
| Room Thermometer               | IN0046                | 12/5/2018        | 12/5/2019            |

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CIE 1931 Chromaticity Diagram



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



Point lies inside the ANSI 5700K 4-step quadrangle

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**Photopic Flux vs. Wavelength**



#####

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 3540             | NR               | 490       | 33363            | NR               | 620       | 80193            | NR               | 750       | 4663             | NR               | 880       | 4678             | NR               |
| 365       | 2862             | NR               | 495       | 44177            | NR               | 625       | 73091            | NR               | 755       | 4147             | NR               | 885       | 4128             | NR               |
| 370       | 2865             | NR               | 500       | 57019            | NR               | 630       | 66269            | NR               | 760       | 4040             | NR               | 890       | 4504             | NR               |
| 375       | 3254             | NR               | 505       | 70030            | NR               | 635       | 60012            | NR               | 765       | 3474             | NR               | 895       | 4371             | NR               |
| 380       | 3076             | NR               | 510       | 81972            | NR               | 640       | 53914            | NR               | 770       | 3469             | NR               | 900       | 4082             | NR               |
| 385       | 2904             | NR               | 515       | 92590            | NR               | 645       | 48385            | NR               | 775       | 3181             | NR               | 905       | 2982             | NR               |
| 390       | 2689             | NR               | 520       | 100305           | NR               | 650       | 43219            | NR               | 780       | 2969             | NR               | 910       | 4351             | NR               |
| 395       | 2619             | NR               | 525       | 107452           | NR               | 655       | 38562            | NR               | 785       | 3132             | NR               | 915       | 3365             | NR               |
| 400       | 2679             | NR               | 530       | 111373           | NR               | 660       | 34110            | NR               | 790       | 2507             | NR               | 920       | 3430             | NR               |
| 405       | 3515             | NR               | 535       | 114505           | NR               | 665       | 30085            | NR               | 795       | 2968             | NR               | 925       | 4264             | NR               |
| 410       | 6934             | NR               | 540       | 116408           | NR               | 670       | 26205            | NR               | 800       | 2758             | NR               | 930       | 4095             | NR               |
| 415       | 14943            | NR               | 545       | 118700           | NR               | 675       | 22906            | NR               | 805       | 2872             | NR               | 935       | 5048             | NR               |
| 420       | 31939            | NR               | 550       | 119209           | NR               | 680       | 20058            | NR               | 810       | 3094             | NR               | 940       | 4074             | NR               |
| 425       | 64701            | NR               | 555       | 120742           | NR               | 685       | 17413            | NR               | 815       | 3222             | NR               | 945       | 4949             | NR               |
| 430       | 110939           | NR               | 560       | 121594           | NR               | 690       | 15447            | NR               | 820       | 3238             | NR               | 950       | 4387             | NR               |
| 435       | 164597           | NR               | 565       | 121913           | NR               | 695       | 13398            | NR               | 825       | 3524             | NR               | 955       | 4978             | NR               |
| 440       | 207696           | NR               | 570       | 122147           | NR               | 700       | 11777            | NR               | 830       | 2921             | NR               | 960       | 4706             | NR               |
| 445       | 201830           | NR               | 575       | 121605           | NR               | 705       | 10412            | NR               | 835       | 3595             | NR               | 965       | 5083             | NR               |
| 450       | 145410           | NR               | 580       | 120248           | NR               | 710       | 9544             | NR               | 840       | 3016             | NR               | 970       | 4522             | NR               |
| 455       | 89594            | NR               | 585       | 117717           | NR               | 715       | 8940             | NR               | 845       | 4032             | NR               | 975       | 4740             | NR               |
| 460       | 58321            | NR               | 590       | 114359           | NR               | 720       | 7897             | NR               | 850       | 3579             | NR               | 980       | 6122             | NR               |
| 465       | 39318            | NR               | 595       | 109974           | NR               | 725       | 7045             | NR               | 855       | 4571             | NR               | 985       | 6450             | NR               |
| 470       | 27693            | NR               | 600       | 105269           | NR               | 730       | 6483             | NR               | 860       | 4485             | NR               | 990       | 4875             | NR               |
| 475       | 23081            | NR               | 605       | 99453            | NR               | 735       | 5838             | NR               | 865       | 3978             | NR               | 995       | 4764             | NR               |
| 480       | 23002            | NR               | 610       | 92921            | NR               | 740       | 5261             | NR               | 870       | 4298             | NR               | 1000      | 3640             | NR               |
| 485       | 26201            | NR               | 615       | 86989            | NR               | 745       | 4760             | NR               | 875       | 4356             | NR               |           |                  |                  |

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**Scotopic Flux vs. Wavelength**



**Scotopic Lumens: 13759.3**

**S/P: 1.85**

| 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       | 3540             | NR               | 490       | 33363            | NR               | 620       | 80193            | NR               | 750       | 4663             | NR               | 880       | 4678             | NR               |
| 365       | 2862             | NR               | 495       | 44177            | NR               | 625       | 73091            | NR               | 755       | 4147             | NR               | 885       | 4128             | NR               |
| 370       | 2865             | NR               | 500       | 57019            | NR               | 630       | 66269            | NR               | 760       | 4040             | NR               | 890       | 4504             | NR               |
| 375       | 3254             | NR               | 505       | 70030            | NR               | 635       | 60012            | NR               | 765       | 3474             | NR               | 895       | 4371             | NR               |
| 380       | 3076             | NR               | 510       | 81972            | NR               | 640       | 53914            | NR               | 770       | 3469             | NR               | 900       | 4082             | NR               |
| 385       | 2904             | NR               | 515       | 92590            | NR               | 645       | 48385            | NR               | 775       | 3181             | NR               | 905       | 2982             | NR               |
| 390       | 2689             | NR               | 520       | 100305           | NR               | 650       | 43219            | NR               | 780       | 2969             | NR               | 910       | 4351             | NR               |
| 395       | 2619             | NR               | 525       | 107452           | NR               | 655       | 38562            | NR               | 785       | 3132             | NR               | 915       | 3365             | NR               |
| 400       | 2679             | NR               | 530       | 111373           | NR               | 660       | 34110            | NR               | 790       | 2507             | NR               | 920       | 3430             | NR               |
| 405       | 3515             | NR               | 535       | 114505           | NR               | 665       | 30085            | NR               | 795       | 2968             | NR               | 925       | 4264             | NR               |
| 410       | 6934             | NR               | 540       | 116408           | NR               | 670       | 26205            | NR               | 800       | 2758             | NR               | 930       | 4095             | NR               |
| 415       | 14943            | NR               | 545       | 118700           | NR               | 675       | 22906            | NR               | 805       | 2872             | NR               | 935       | 5048             | NR               |
| 420       | 31939            | NR               | 550       | 119209           | NR               | 680       | 20058            | NR               | 810       | 3094             | NR               | 940       | 4074             | NR               |
| 425       | 64701            | NR               | 555       | 120742           | NR               | 685       | 17413            | NR               | 815       | 3222             | NR               | 945       | 4949             | NR               |
| 430       | 110939           | NR               | 560       | 121594           | NR               | 690       | 15447            | NR               | 820       | 3238             | NR               | 950       | 4387             | NR               |
| 435       | 164597           | NR               | 565       | 121913           | NR               | 695       | 13398            | NR               | 825       | 3524             | NR               | 955       | 4978             | NR               |
| 440       | 207696           | NR               | 570       | 122147           | NR               | 700       | 11777            | NR               | 830       | 2921             | NR               | 960       | 4706             | NR               |
| 445       | 201830           | NR               | 575       | 121605           | NR               | 705       | 10412            | NR               | 835       | 3595             | NR               | 965       | 5083             | NR               |
| 450       | 145410           | NR               | 580       | 120248           | NR               | 710       | 9544             | NR               | 840       | 3016             | NR               | 970       | 4522             | NR               |
| 455       | 89594            | NR               | 585       | 117717           | NR               | 715       | 8940             | NR               | 845       | 4032             | NR               | 975       | 4740             | NR               |
| 460       | 58321            | NR               | 590       | 114359           | NR               | 720       | 7897             | NR               | 850       | 3579             | NR               | 980       | 6122             | NR               |
| 465       | 39318            | NR               | 595       | 109974           | NR               | 725       | 7045             | NR               | 855       | 4571             | NR               | 985       | 6450             | NR               |
| 470       | 27693            | NR               | 600       | 105269           | NR               | 730       | 6483             | NR               | 860       | 4485             | NR               | 990       | 4875             | NR               |
| 475       | 23081            | NR               | 605       | 99453            | NR               | 735       | 5838             | NR               | 865       | 3978             | NR               | 995       | 4764             | NR               |
| 480       | 23002            | NR               | 610       | 92921            | NR               | 740       | 5261             | NR               | 870       | 4298             | NR               | 1000      | 3640             | NR               |
| 485       | 26201            | NR               | 615       | 86989            | NR               | 745       | 4760             | NR               | 875       | 4356             | NR               |           |                  |                  |

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**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: 5527.6 M/P: 0.74**

| 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       | 3540             | NR               | 490       | 33363            | NR               | 620       | 80193            | NR               | 750       | 4663             | NR               | 880       | 4678             | NR               |
| 365       | 2862             | NR               | 495       | 44177            | NR               | 625       | 73091            | NR               | 755       | 4147             | NR               | 885       | 4128             | NR               |
| 370       | 2865             | NR               | 500       | 57019            | NR               | 630       | 66269            | NR               | 760       | 4040             | NR               | 890       | 4504             | NR               |
| 375       | 3254             | NR               | 505       | 70030            | NR               | 635       | 60012            | NR               | 765       | 3474             | NR               | 895       | 4371             | NR               |
| 380       | 3076             | NR               | 510       | 81972            | NR               | 640       | 53914            | NR               | 770       | 3469             | NR               | 900       | 4082             | NR               |
| 385       | 2904             | NR               | 515       | 92590            | NR               | 645       | 48385            | NR               | 775       | 3181             | NR               | 905       | 2982             | NR               |
| 390       | 2689             | NR               | 520       | 100305           | NR               | 650       | 43219            | NR               | 780       | 2969             | NR               | 910       | 4351             | NR               |
| 395       | 2619             | NR               | 525       | 107452           | NR               | 655       | 38562            | NR               | 785       | 3132             | NR               | 915       | 3365             | NR               |
| 400       | 2679             | NR               | 530       | 111373           | NR               | 660       | 34110            | NR               | 790       | 2507             | NR               | 920       | 3430             | NR               |
| 405       | 3515             | NR               | 535       | 114505           | NR               | 665       | 30085            | NR               | 795       | 2968             | NR               | 925       | 4264             | NR               |
| 410       | 6934             | NR               | 540       | 116408           | NR               | 670       | 26205            | NR               | 800       | 2758             | NR               | 930       | 4095             | NR               |
| 415       | 14943            | NR               | 545       | 118700           | NR               | 675       | 22906            | NR               | 805       | 2872             | NR               | 935       | 5048             | NR               |
| 420       | 31939            | NR               | 550       | 119209           | NR               | 680       | 20058            | NR               | 810       | 3094             | NR               | 940       | 4074             | NR               |
| 425       | 64701            | NR               | 555       | 120742           | NR               | 685       | 17413            | NR               | 815       | 3222             | NR               | 945       | 4949             | NR               |
| 430       | 110939           | NR               | 560       | 121594           | NR               | 690       | 15447            | NR               | 820       | 3238             | NR               | 950       | 4387             | NR               |
| 435       | 164597           | NR               | 565       | 121913           | NR               | 695       | 13398            | NR               | 825       | 3524             | NR               | 955       | 4978             | NR               |
| 440       | 207696           | NR               | 570       | 122147           | NR               | 700       | 11777            | NR               | 830       | 2921             | NR               | 960       | 4706             | NR               |
| 445       | 201830           | NR               | 575       | 121605           | NR               | 705       | 10412            | NR               | 835       | 3595             | NR               | 965       | 5083             | NR               |
| 450       | 145410           | NR               | 580       | 120248           | NR               | 710       | 9544             | NR               | 840       | 3016             | NR               | 970       | 4522             | NR               |
| 455       | 89594            | NR               | 585       | 117717           | NR               | 715       | 8940             | NR               | 845       | 4032             | NR               | 975       | 4740             | NR               |
| 460       | 58321            | NR               | 590       | 114359           | NR               | 720       | 7897             | NR               | 850       | 3579             | NR               | 980       | 6122             | NR               |
| 465       | 39318            | NR               | 595       | 109974           | NR               | 725       | 7045             | NR               | 855       | 4571             | NR               | 985       | 6450             | NR               |
| 470       | 27693            | NR               | 600       | 105269           | NR               | 730       | 6483             | NR               | 860       | 4485             | NR               | 990       | 4875             | NR               |
| 475       | 23081            | NR               | 605       | 99453            | NR               | 735       | 5838             | NR               | 865       | 3978             | NR               | 995       | 4764             | NR               |
| 480       | 23002            | NR               | 610       | 92921            | NR               | 740       | 5261             | NR               | 870       | 4298             | NR               | 1000      | 3640             | NR               |
| 485       | 26201            | NR               | 615       | 86989            | NR               | 745       | 4760             | NR               | 875       | 4356             | NR               |           |                  |                  |

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**Summary**

$R_f = 72.1$   
 $R_g = 97.2$   
 CIE  $R_a = 71.7$   
 $R_g = -27.1$



**Color Vector Graphics**



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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 54 | CES51 = 88 | CES76 = 43 |
| CES02 = 59 | CES27 = 79 | CES52 = 90 | CES77 = 64 |
| CES03 = 30 | CES28 = 77 | CES53 = 77 | CES78 = 46 |
| CES04 = 69 | CES29 = 50 | CES54 = 81 | CES79 = 74 |
| CES05 = 46 | CES30 = 59 | CES55 = 80 | CES80 = 70 |
| CES06 = 50 | CES31 = 55 | CES56 = 70 | CES81 = 71 |
| CES07 = 38 | CES32 = 52 | CES57 = 68 | CES82 = 88 |
| CES08 = 38 | CES33 = 63 | CES58 = 70 | CES83 = 82 |
| CES09 = 29 | CES34 = 63 | CES59 = 88 | CES84 = 87 |
| CES10 = 72 | CES35 = 79 | CES60 = 92 | CES85 = 84 |
| CES11 = 55 | CES36 = 90 | CES61 = 88 | CES86 = 76 |
| CES12 = 61 | CES37 = 72 | CES62 = 81 | CES87 = 75 |
| CES13 = 41 | CES38 = 68 | CES63 = 75 | CES88 = 77 |
| CES14 = 74 | CES39 = 91 | CES64 = 72 | CES89 = 76 |
| CES15 = 70 | CES40 = 83 | CES65 = 65 | CES90 = 76 |
| CES16 = 46 | CES41 = 84 | CES66 = 66 | CES91 = 92 |
| CES17 = 48 | CES42 = 70 | CES67 = 64 | CES92 = 70 |
| CES18 = 55 | CES43 = 69 | CES68 = 71 | CES93 = 83 |
| CES19 = 70 | CES44 = 98 | CES69 = 80 | CES94 = 60 |
| CES20 = 64 | CES45 = 79 | CES70 = 58 | CES95 = 73 |
| CES21 = 85 | CES46 = 78 | CES71 = 55 | CES96 = 79 |
| CES22 = 77 | CES47 = 76 | CES72 = 84 | CES97 = 84 |
| CES23 = 91 | CES48 = 68 | CES73 = 47 | CES98 = 73 |
| CES24 = 90 | CES49 = 78 | CES74 = 94 | CES99 = 62 |
| CES25 = 71 | CES50 = 87 | CES75 = 51 |            |



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Color Rendition by Hue-Angle Bin



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**Measure Comparisons**



(END OF REPORT)