

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



Scaled data based on original data using  
LM-79-2019 Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Test Report Prepared for

Cooper Lighting Solutions

Brand: McGRAW-EDISON

Report Number: P636160

Luminaire Tested: GWS-SA3F-730-U-SL2-W-GRSWH

Issue Date: 1/10/2023

**Test Information**

Test Method: LM-79-2019  
Report Number: P636160  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2209-782-29)  
Test Lab: COOPER LIGHTING SOLUTIONS  
Issue Date: 1/10/2023  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: McGRAW-EDISON  
Catalog Number: GWS-SA3F-730-U-SL2-W-GRSWH  
Description: GALLEON WALL SLIM LUMINAIRE. (3) LIGHTSQUARES WITH 16 LEDS EACH AND TYPE II SPILL LIGHT ELIMINATOR OPTICS W/ FACTORY INSTALLED GLARE SHIELD, WH  
Light Source: (48) 3000K CCT, 70 CRI LEDS  
Ballast/Driver: -

**Summary**

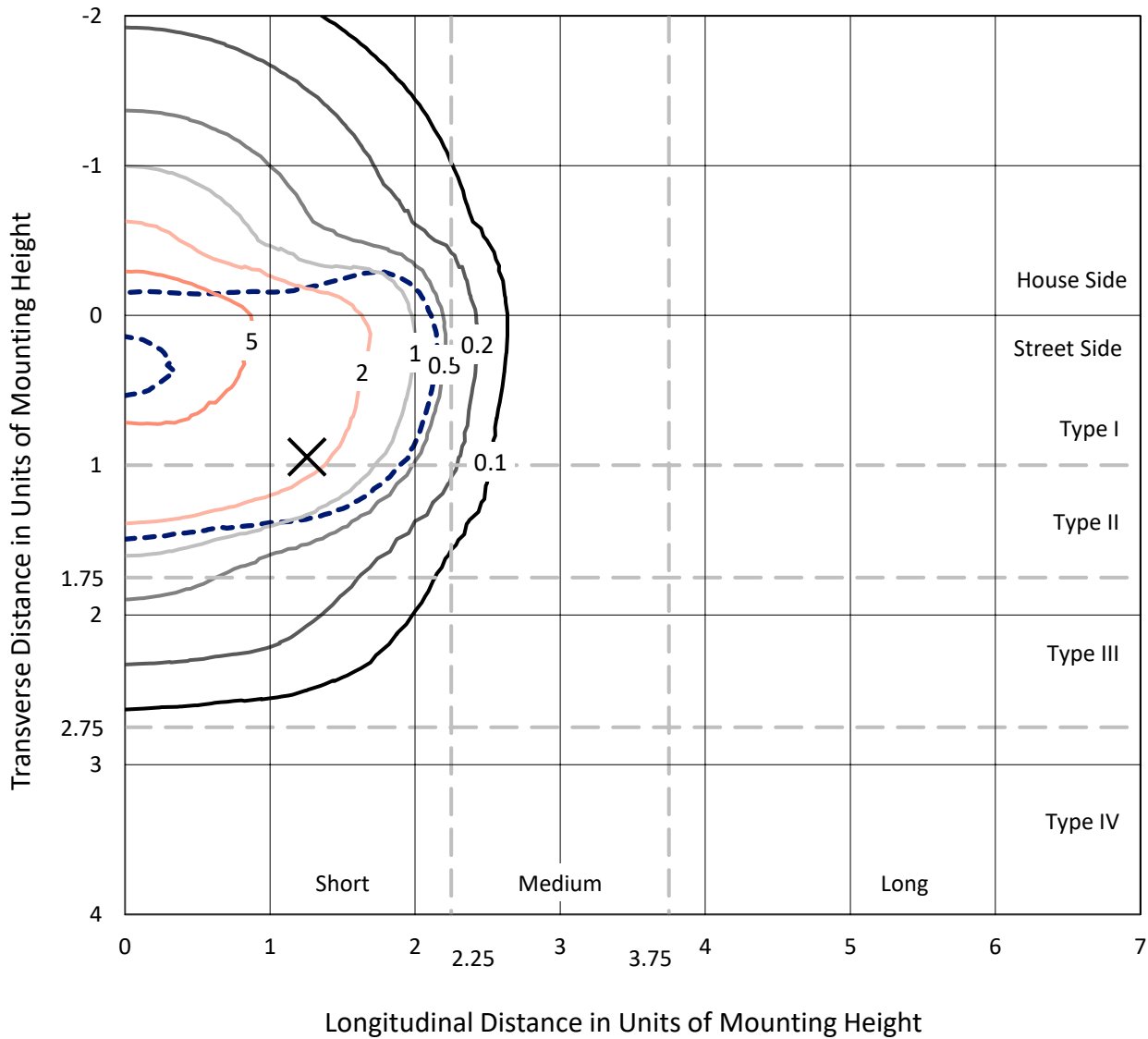
Lumens per Lamp: N/A  
Luminaire Lumens: 18963.5 lumens  
Efficiency: N/A  
Efficacy: 103.5 lumens/watt  
Luminous Opening: Rectangular (W 1.5' x L: 0.5' x H: 0')  
IES Classification: Type II - Short  
BUG Rating: B3 - U0 - G3  
  
Input Watts (W): 183.2  
Input Voltage (V): 120  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 0  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 28.75 FT



REPORT NUMBER: P636160  
 CATALOG NUMBER: GWS-SA3F-730-U-SL2-W-GRSWH

### Iso-Footcandle Lines of Horizontal Illumination

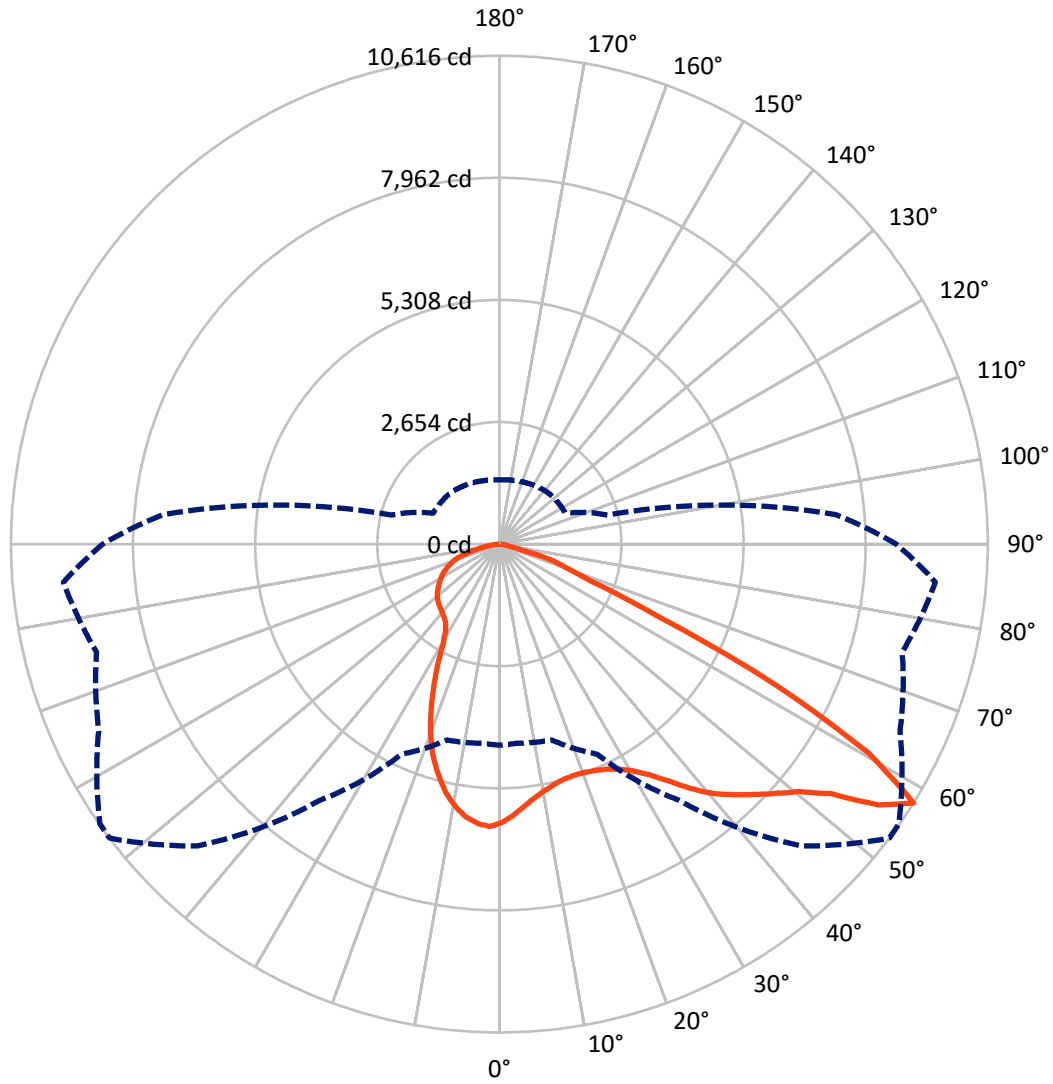
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 9.7 fc  
 Type II - Short - N/A

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### Luminous Intensity Polar Plot



— Vertical Plane Through 53-Deg Lateral    - - - Horizontal Cone Through 57.5-Deg Vertical

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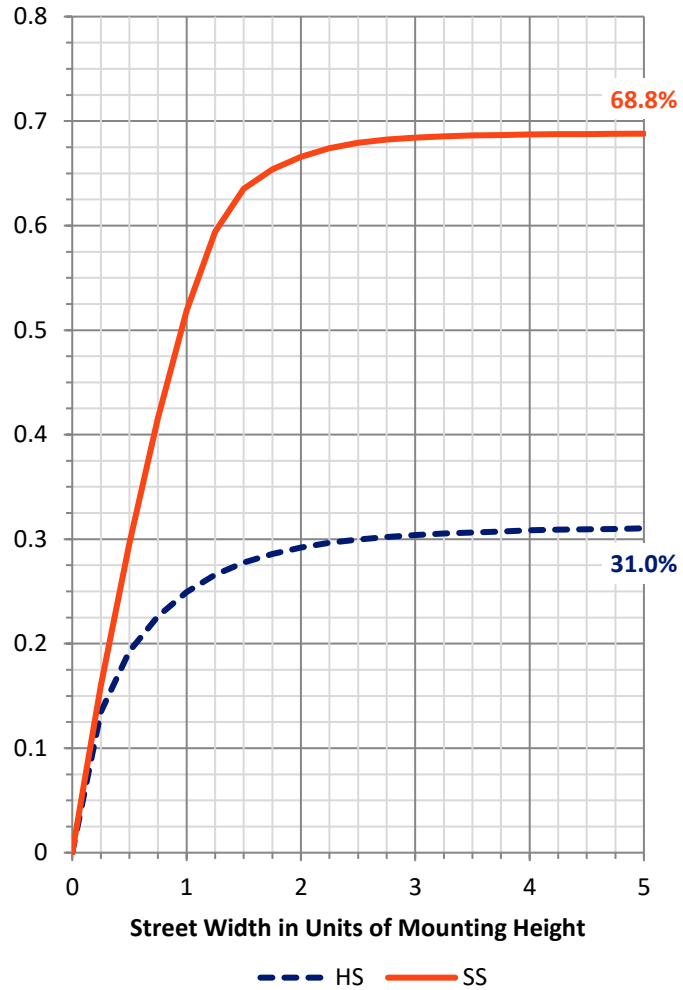
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 5929.2   | 0.0    | 5929.2  |
|                    | % Fixture | 31.3     | 0.0    | 31.3    |
| <b>Street Side</b> | Lumens    | 13034.3  | 0.0    | 13034.3 |
|                    | % Fixture | 68.7     | 0.0    | 68.7    |
| <b>Total</b>       | Lumens    | 18963.5  | 0.0    | 18963.5 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 547.6   | 2.9       |
| 10°-20°   | 1436.7  | 7.6       |
| 20°-30°   | 2116.7  | 11.2      |
| 30°-40°   | 2962.8  | 15.6      |
| 40°-50°   | 3894.9  | 20.5      |
| 50°-60°   | 4566.7  | 24.1      |
| 60°-70°   | 2690.3  | 14.2      |
| 70°-80°   | 669.3   | 3.5       |
| 80°-90°   | 78.5    | 0.4       |
| 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°    | 18963.5 | 100.0     |
| 0°-180°   | 18963.5 | 100.0     |

**Coefficient of Utilization**



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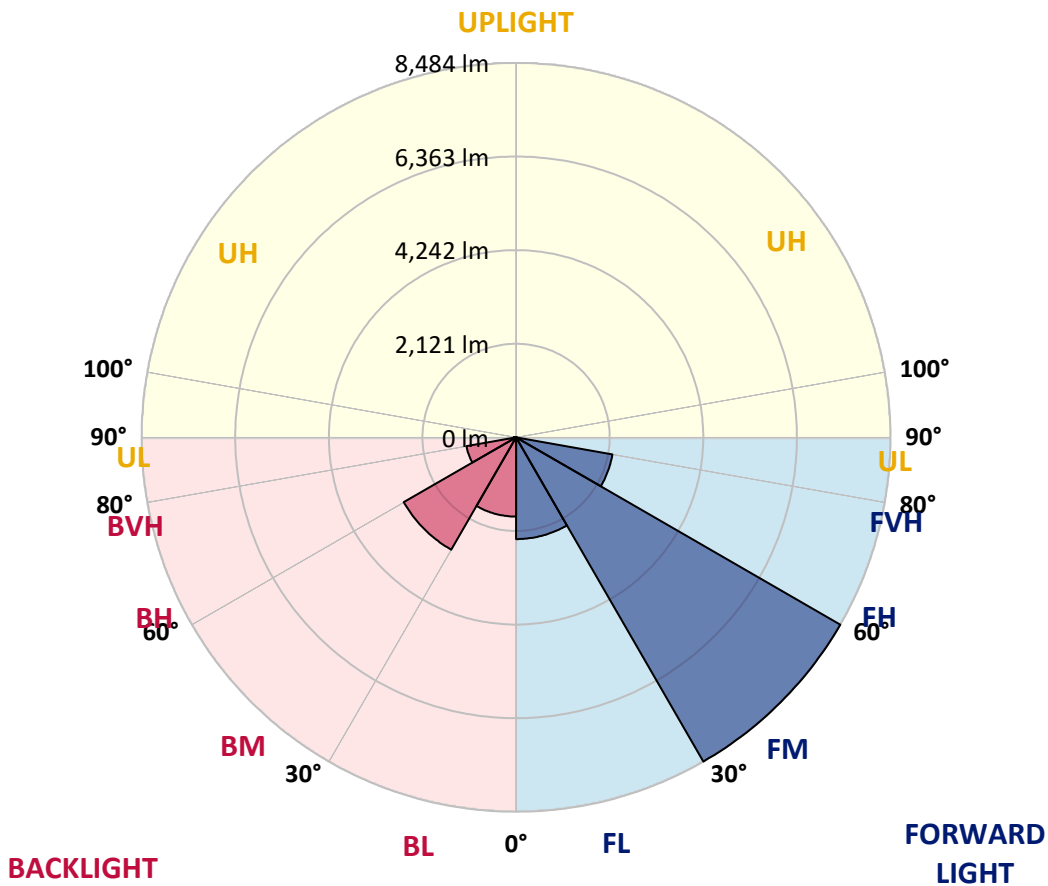
CATALOG NUMBER: GWS-SA3F-730-U-SL2-W-GRSWH

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

| Zone           | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|----------------|--------|-----------|-------------------------|------|---------|
|                |        |           | B                       | U    | G       |
| FL (0°-30°)    | 2305.6 | 12.2      |                         |      |         |
| FM (30°-60°)   | 8484.4 | 44.7      |                         |      |         |
| FH (60°-80°)   | 2218.0 | 11.7      |                         |      | G2/5000 |
| FVH (80°-90°)  | 26.3   | 0.1       |                         |      | G1/100  |
| BL (0°-30°)    | 1795.4 | 9.5       | B3/2500                 |      |         |
| BM (30°-60°)   | 2940.0 | 15.5      | B3/5000                 |      |         |
| BH (60°-80°)   | 1141.6 | 6.0       | B3/2500                 |      | G3/2500 |
| BVH (80°-90°)  | 52.2   | 0.3       |                         |      | G1/100  |
| UL (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B3-U0-G3**

Type II Short





REPORT NUMBER: P636160

CATALOG NUMBER: GWS-SA3F-730-U-SL2-W-GRSWH

**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°     | 53°     | 55°     | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|---------|---------|---------|--------|--------|--------|
| 0°    | 6055.6 | 6055.6 | 6055.6 | 6055.6 | 6055.6 | 6055.6  | 6055.6  | 6055.6  | 6055.6 | 6055.6 | 6055.6 |
| 2.5°  | 5707.6 | 5723.6 | 5726.8 | 5776.2 | 5779.4 | 5851.3  | 5899.1  | 5889.6  | 5939.0 | 5999.7 | 6047.6 |
| 5°    | 5434.7 | 5436.3 | 5452.2 | 5511.3 | 5543.2 | 5637.4  | 5717.2  | 5717.2  | 5813.0 | 5937.4 | 6044.4 |
| 7.5°  | 5209.6 | 5208.0 | 5222.4 | 5287.8 | 5340.5 | 5453.8  | 5562.4  | 5575.1  | 5709.2 | 5891.2 | 6065.1 |
| 10°   | 5000.5 | 5011.7 | 5027.7 | 5107.5 | 5174.5 | 5315.0  | 5444.3  | 5465.0  | 5634.2 | 5859.2 | 6093.9 |
| 12.5° | 4866.5 | 4868.1 | 4892.0 | 4981.4 | 5067.6 | 5217.6  | 5353.3  | 5378.8  | 5573.5 | 5828.9 | 6114.6 |
| 15°   | 4780.3 | 4781.9 | 4807.4 | 4906.4 | 5006.9 | 5158.6  | 5297.4  | 5326.1  | 5538.4 | 5824.1 | 6154.5 |
| 17.5° | 4742.0 | 4740.4 | 4764.3 | 4863.3 | 4973.4 | 5131.4  | 5279.9  | 5315.0  | 5554.4 | 5860.8 | 6224.7 |
| 20°   | 4742.0 | 4743.6 | 4756.3 | 4845.7 | 4957.4 | 5125.0  | 5297.4  | 5340.5  | 5616.6 | 5943.8 | 6333.3 |
| 22.5° | 4809.0 | 4815.4 | 4821.8 | 4882.4 | 4970.2 | 5134.6  | 5343.7  | 5401.2  | 5750.7 | 6082.7 | 6475.3 |
| 25°   | 4939.9 | 4941.5 | 4947.9 | 4997.4 | 5037.3 | 5161.7  | 5420.3  | 5506.5  | 5959.8 | 6285.4 | 6654.1 |
| 27.5° | 5115.5 | 5137.8 | 5144.2 | 5176.1 | 5176.1 | 5228.8  | 5540.0  | 5664.5  | 6242.3 | 6577.5 | 6882.3 |
| 30°   | 5361.3 | 5369.2 | 5380.4 | 5415.5 | 5377.2 | 5354.9  | 5715.6  | 5875.2  | 6569.5 | 6930.2 | 7156.9 |
| 32.5° | 5576.7 | 5594.3 | 5654.9 | 5712.4 | 5643.8 | 5573.5  | 5974.2  | 6162.5  | 6883.9 | 7297.3 | 7448.9 |
| 35°   | 5760.3 | 5803.4 | 5919.9 | 6047.6 | 5999.7 | 5929.5  | 6317.3  | 6513.6  | 7142.5 | 7560.7 | 7707.5 |
| 37.5° | 5982.1 | 6015.7 | 6175.3 | 6382.8 | 6425.9 | 6392.3  | 6735.5  | 6875.9  | 7314.9 | 7627.7 | 7848.0 |
| 40°   | 6207.2 | 6258.3 | 6464.2 | 6751.5 | 6915.8 | 6939.8  | 7121.7  | 7215.9  | 7373.9 | 7496.8 | 7820.8 |
| 42.5° | 6437.0 | 6524.8 | 6807.3 | 7142.5 | 7434.6 | 7488.8  | 7447.3  | 7487.2  | 7354.8 | 7316.5 | 7694.7 |
| 45°   | 6717.9 | 6821.7 | 7140.9 | 7568.6 | 7953.3 | 8037.9  | 7766.6  | 7729.9  | 7351.6 | 7247.8 | 7616.5 |
| 47.5° | 7049.9 | 7153.7 | 7458.5 | 7956.5 | 8448.1 | 8510.3  | 8093.8  | 8026.7  | 7463.3 | 7353.2 | 7721.9 |
| 50°   | 7343.6 | 7415.4 | 7688.4 | 8245.4 | 8909.4 | 8946.1  | 8454.5  | 8373.1  | 7741.0 | 7645.3 | 8050.7 |
| 52.5° | 7045.1 | 7037.2 | 7324.4 | 8010.8 | 9148.8 | 9590.9  | 9009.9  | 8931.7  | 8277.3 | 8130.5 | 8559.8 |
| 55°   | 5977.3 | 5886.4 | 6143.3 | 6818.5 | 8480.0 | 10163.9 | 10005.9 | 9849.5  | 8992.4 | 8618.9 | 9037.1 |
| 57.5° | 4370.1 | 4344.6 | 4406.8 | 5040.4 | 6793.0 | 9276.5  | 10615.6 | 10601.2 | 9610.0 | 9065.8 | 9512.7 |
| 60°   | 3417.2 | 3378.9 | 3212.9 | 3230.5 | 4630.3 | 7246.2  | 9212.6  | 9635.6  | 9993.1 | 9333.9 | 9844.7 |
| 62.5° | 3034.2 | 3005.4 | 2919.2 | 2681.4 | 2758.0 | 4858.5  | 6753.0  | 7140.9  | 8732.2 | 8243.8 | 8456.1 |
| 65°   | 2512.2 | 2504.3 | 2576.1 | 2566.5 | 2311.1 | 2683.0  | 3811.5  | 4202.5  | 5490.5 | 5559.2 | 5490.5 |
| 67.5° | 1825.9 | 1811.6 | 1993.5 | 2352.6 | 2224.9 | 2025.4  | 2124.4  | 2260.1  | 2815.5 | 2528.2 | 2276.0 |
| 70°   | 1187.5 | 1166.7 | 1272.1 | 1699.8 | 1991.9 | 1765.3  | 1530.6  | 1508.3  | 1548.2 | 962.4  | 1040.6 |
| 72.5° | 796.4  | 772.5  | 770.9  | 935.3  | 1203.5 | 1189.1  | 1185.9  | 1174.7  | 1048.6 | 759.7  | 842.7  |
| 75°   | 443.7  | 424.6  | 419.8  | 403.8  | 430.9  | 438.9   | 467.7   | 483.6   | 523.5  | 576.2  | 638.4  |
| 77.5° | 75.0   | 73.4   | 92.6   | 118.1  | 162.8  | 209.1   | 258.6   | 272.9   | 336.8  | 399.0  | 438.9  |
| 80°   | 41.5   | 43.1   | 55.9   | 68.6   | 91.0   | 124.5   | 159.6   | 169.2   | 207.5  | 241.0  | 272.9  |
| 82.5° | 22.3   | 22.3   | 28.7   | 36.7   | 49.5   | 65.4    | 86.2    | 94.2    | 119.7  | 140.5  | 162.8  |
| 85°   | 8.0    | 8.0    | 11.2   | 14.4   | 20.7   | 27.1    | 33.5    | 38.3    | 52.7   | 71.8   | 81.4   |
| 87.5° | 0.0    | 0.0    | 0.0    | 0.0    | 1.6    | 3.2     | 6.4     | 6.4     | 8.0    | 14.4   | 20.7   |
| 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: P636160

CATALOG NUMBER: GWS-SA3F-730-U-SL2-W-GRSWH

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 6055.6 | 6055.6 | 6055.6 | 6055.6 | 6055.6 | 6055.6 | 6055.6 | 6055.6 | 6055.6 | 6055.6 | 6055.6 |
| 2.5°  | 6087.5 | 6044.4 | 6103.4 | 6130.6 | 6140.2 | 6146.5 | 6105.0 | 6076.3 | 6066.7 | 6036.4 | 6018.8 |
| 5°    | 6109.8 | 6081.1 | 6137.0 | 6137.0 | 6097.1 | 6055.6 | 5971.0 | 5911.9 | 5870.4 | 5820.9 | 5813.0 |
| 7.5°  | 6148.1 | 6127.4 | 6157.7 | 6095.5 | 5994.9 | 5883.2 | 5736.3 | 5621.4 | 5528.8 | 5468.2 | 5469.8 |
| 10°   | 6199.2 | 6173.7 | 6149.7 | 6010.9 | 5827.3 | 5621.4 | 5396.4 | 5228.8 | 5075.6 | 5005.3 | 4967.0 |
| 12.5° | 6232.7 | 6196.0 | 6095.5 | 5865.6 | 5595.9 | 5319.8 | 5002.1 | 4753.2 | 4531.3 | 4430.7 | 4422.8 |
| 15°   | 6274.2 | 6207.2 | 6006.1 | 5677.3 | 5302.2 | 4925.5 | 4516.9 | 4170.6 | 3870.5 | 3714.1 | 3706.1 |
| 17.5° | 6328.5 | 6218.4 | 5899.1 | 5461.8 | 4992.6 | 4437.1 | 3923.2 | 3487.5 | 3168.2 | 3046.9 | 3067.7 |
| 20°   | 6405.1 | 6231.1 | 5777.8 | 5222.4 | 4607.9 | 3881.7 | 3241.7 | 2841.0 | 2718.1 | 2710.2 | 2694.2 |
| 22.5° | 6491.3 | 6239.1 | 5643.8 | 4954.3 | 4141.8 | 3289.5 | 2678.2 | 2507.5 | 2505.9 | 2545.8 | 2555.3 |
| 25°   | 6588.7 | 6245.5 | 5492.1 | 4641.4 | 3637.5 | 2699.0 | 2368.6 | 2317.5 | 2357.4 | 2432.4 | 2442.0 |
| 27.5° | 6713.1 | 6258.3 | 5308.6 | 4298.3 | 3101.2 | 2331.9 | 2197.8 | 2185.0 | 2232.9 | 2303.2 | 2300.0 |
| 30°   | 6896.7 | 6304.5 | 5113.9 | 3904.0 | 2550.5 | 2157.9 | 2094.1 | 2095.7 | 2114.8 | 2148.3 | 2153.1 |
| 32.5° | 7083.4 | 6376.4 | 4923.9 | 3460.3 | 2234.5 | 2059.0 | 2030.2 | 2027.0 | 2027.0 | 2041.4 | 2044.6 |
| 35°   | 7260.6 | 6457.8 | 4718.0 | 2997.5 | 2081.3 | 2001.5 | 1982.3 | 1972.8 | 1968.0 | 1964.8 | 1960.0 |
| 37.5° | 7359.6 | 6497.7 | 4516.9 | 2541.0 | 1999.9 | 1963.2 | 1944.0 | 1931.3 | 1913.7 | 1900.9 | 1897.7 |
| 40°   | 7316.5 | 6451.4 | 4283.9 | 2199.4 | 1950.4 | 1926.5 | 1904.1 | 1886.6 | 1862.6 | 1851.5 | 1845.1 |
| 42.5° | 7172.8 | 6307.7 | 4030.1 | 2038.2 | 1910.5 | 1886.6 | 1859.4 | 1830.7 | 1814.8 | 1805.2 | 1803.6 |
| 45°   | 7021.2 | 6133.8 | 3723.7 | 1944.0 | 1872.2 | 1843.5 | 1811.6 | 1779.6 | 1762.1 | 1757.3 | 1755.7 |
| 47.5° | 7016.4 | 6047.6 | 3398.1 | 1869.0 | 1825.9 | 1797.2 | 1757.3 | 1725.4 | 1706.2 | 1699.8 | 1693.4 |
| 50°   | 7227.1 | 6135.4 | 3031.0 | 1803.6 | 1778.0 | 1747.7 | 1703.0 | 1667.9 | 1644.0 | 1636.0 | 1634.4 |
| 52.5° | 7664.4 | 6465.8 | 2702.2 | 1738.1 | 1714.2 | 1679.1 | 1642.4 | 1607.3 | 1578.5 | 1564.2 | 1562.6 |
| 55°   | 8136.9 | 6885.5 | 2497.9 | 1671.1 | 1639.2 | 1608.9 | 1575.3 | 1537.0 | 1505.1 | 1482.8 | 1479.6 |
| 57.5° | 8625.3 | 7343.6 | 2435.6 | 1586.5 | 1562.6 | 1541.8 | 1501.9 | 1460.4 | 1423.7 | 1403.0 | 1398.2 |
| 60°   | 9027.5 | 7737.8 | 2552.1 | 1497.1 | 1484.4 | 1457.2 | 1420.5 | 1380.6 | 1355.1 | 1339.1 | 1335.9 |
| 62.5° | 7557.5 | 6299.8 | 2060.5 | 1399.8 | 1399.8 | 1371.0 | 1329.5 | 1300.8 | 1283.3 | 1272.1 | 1268.9 |
| 65°   | 4796.2 | 3900.8 | 1406.2 | 1302.4 | 1300.8 | 1262.5 | 1227.4 | 1208.2 | 1200.3 | 1182.7 | 1179.5 |
| 67.5° | 2089.3 | 1782.8 | 1201.9 | 1203.5 | 1197.1 | 1155.6 | 1120.5 | 1106.1 | 1090.1 | 1071.0 | 1069.4 |
| 70°   | 1083.7 | 1104.5 | 1075.8 | 1093.3 | 1082.1 | 1032.7 | 999.2  | 976.8  | 943.3  | 924.1  | 925.7  |
| 72.5° | 874.7  | 897.0  | 928.9  | 956.1  | 932.1  | 892.2  | 839.5  | 812.4  | 769.3  | 748.6  | 750.2  |
| 75°   | 667.2  | 691.1  | 721.4  | 750.2  | 731.0  | 681.5  | 648.0  | 620.9  | 571.4  | 547.5  | 552.2  |
| 77.5° | 459.7  | 472.4  | 509.2  | 507.6  | 501.2  | 486.8  | 437.3  | 405.4  | 354.3  | 325.6  | 328.8  |
| 80°   | 285.7  | 293.7  | 311.2  | 319.2  | 316.0  | 296.9  | 257.0  | 233.0  | 202.7  | 185.1  | 186.7  |
| 82.5° | 172.4  | 177.2  | 193.1  | 194.7  | 193.1  | 178.8  | 148.4  | 130.9  | 111.7  | 102.1  | 102.1  |
| 85°   | 87.8   | 91.0   | 100.6  | 100.6  | 91.0   | 76.6   | 68.6   | 60.7   | 49.5   | 44.7   | 44.7   |
| 87.5° | 23.9   | 23.9   | 30.3   | 25.5   | 20.7   | 19.2   | 9.6    | 8.0    | 3.2    | 1.6    | 1.6    |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |



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



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

Report Prepared for

Cooper Lighting Solutions

McGRAW-EDISON

Report Number: SP1-1908-441-2-R4

Test Date: 10/03/2019

Luminaire Tested: SA1C-730-U-5WQ

Data in this report applies to families of products SA1C-730-U-5WQ .

**Test Information**

Test Method: LM-79-2008  
 Report Number: SP1-1908-441-2-R4  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry: 4π  
 Issue Date: 10/28/2024  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: McGRAW-EDISON  
 Catalog Number: **SA1C-730-U-5WQ**  
 Description: McGRAW EDISON ROADWAY AND AREA LUMINAIRE

\*\*\*THIS IS A REVISION OF SP1-1908-441-2-R3. TO UPDATE THE CATALOG INFORMATION.\*\*\*TESTED IN SITU. (1) 70 CRI, 3000K, 1050MA LIGHTSQUARE WITH 16 LEDS AND TYPE V WIDE OPTICS.

**Spectral Parameters**

|                           |        |           |      |      |       |
|---------------------------|--------|-----------|------|------|-------|
| CCT (K):                  | 2993   | CRI (Ra): | 71.8 | R9:  | -38.3 |
| CIE u':                   | 0.2508 | R1:       | 67.5 | R10: | 62.5  |
| CIE v':                   | 0.5215 | R2:       | 82.9 | R11: | 63.7  |
| Duv:                      | 0.0000 | R3:       | 94.7 | R12: | 57.8  |
| CIE x:                    | 0.4374 | R4:       | 67.7 | R13: | 70.4  |
| CIE y:                    | 0.4043 | R5:       | 67.9 | R14: | 97.3  |
| CIE z:                    | 0.1583 | R6:       | 77.6 |      |       |
| Peak Wavelength (nm):     | 593    | R7:       | 76.0 |      |       |
| Dominant Wavelength (nm): | 582    | R8:       | 40.5 |      |       |
| Purity:                   | 53     |           |      |      |       |
| Rf:                       | 75.7   |           |      |      |       |
| Rg:                       | 93.9   |           |      |      |       |



**Test Conditions**

Stabilization Time: 53M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 25.0./44%  
 Sphere Temperature (°C): 25.7

REPORT NUMBER: SP1-1908-441-2-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            |

REPORT NUMBER: SP1-1908-441-2-R4

CIE 1931 Chromaticity Diagram



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



Point lies inside the ANSI 3000K 4-step quadrangle

REPORT NUMBER: SP1-1908-441-2-R4

**Photopic Flux vs. Wavelength**

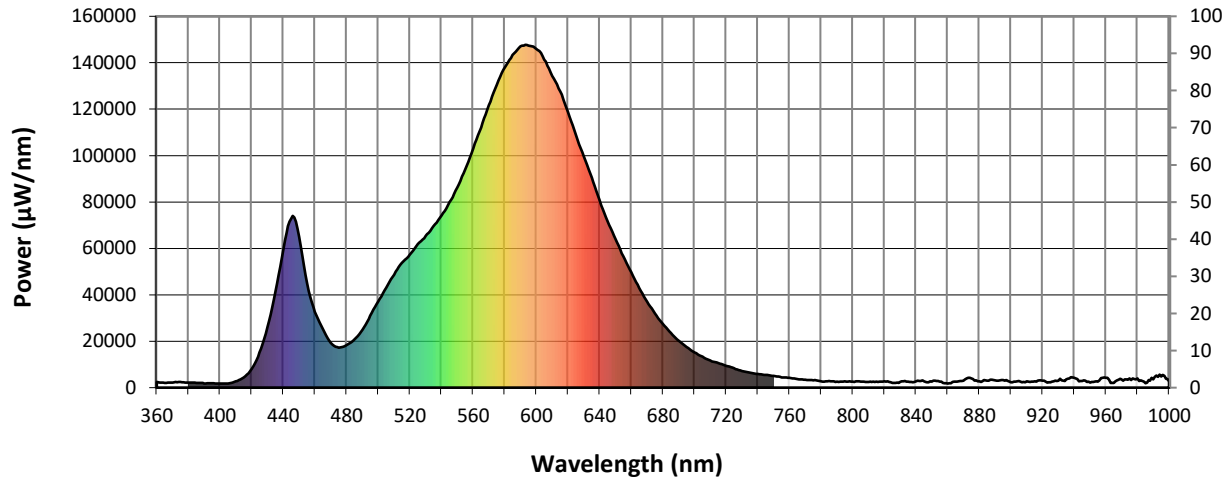


#####

| 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    | 2397          | NR            | 490    | 24908         | NR            | 620    | 118784        | NR            | 750    | 5037          | NR            | 880    | 2677          | NR            |
| 365    | 2084          | NR            | 495    | 30998         | NR            | 625    | 108951        | NR            | 755    | 4413          | NR            | 885    | 2940          | NR            |
| 370    | 2143          | NR            | 500    | 37103         | NR            | 630    | 99573         | NR            | 760    | 4189          | NR            | 890    | 3116          | NR            |
| 375    | 2413          | NR            | 505    | 42987         | NR            | 635    | 90444         | NR            | 765    | 3677          | NR            | 895    | 3345          | NR            |
| 380    | 2172          | NR            | 510    | 48702         | NR            | 640    | 80749         | NR            | 770    | 3366          | NR            | 900    | 2312          | NR            |
| 385    | 1997          | NR            | 515    | 53741         | NR            | 645    | 71664         | NR            | 775    | 3211          | NR            | 905    | 2829          | NR            |
| 390    | 1830          | NR            | 520    | 57283         | NR            | 650    | 63936         | NR            | 780    | 2682          | NR            | 910    | 2783          | NR            |
| 395    | 1861          | NR            | 525    | 61876         | NR            | 655    | 56611         | NR            | 785    | 2804          | NR            | 915    | 2662          | NR            |
| 400    | 1717          | NR            | 530    | 65398         | NR            | 660    | 49763         | NR            | 790    | 2581          | NR            | 920    | 3047          | NR            |
| 405    | 1761          | NR            | 535    | 69597         | NR            | 665    | 42891         | NR            | 795    | 2711          | NR            | 925    | 2256          | NR            |
| 410    | 2680          | NR            | 540    | 74214         | NR            | 670    | 36939         | NR            | 800    | 2609          | NR            | 930    | 2976          | NR            |
| 415    | 4374          | NR            | 545    | 79911         | NR            | 675    | 31946         | NR            | 805    | 2581          | NR            | 935    | 3503          | NR            |
| 420    | 8071          | NR            | 550    | 86153         | NR            | 680    | 27385         | NR            | 810    | 2404          | NR            | 940    | 4226          | NR            |
| 425    | 15169         | NR            | 555    | 93952         | NR            | 685    | 23504         | NR            | 815    | 2556          | NR            | 945    | 2930          | NR            |
| 430    | 26038         | NR            | 560    | 102904        | NR            | 690    | 20210         | NR            | 820    | 2742          | NR            | 950    | 2115          | NR            |
| 435    | 41316         | NR            | 565    | 112009        | NR            | 695    | 17459         | NR            | 825    | 2014          | NR            | 955    | 2634          | NR            |
| 440    | 59674         | NR            | 570    | 121662        | NR            | 700    | 15207         | NR            | 830    | 2488          | NR            | 960    | 4200          | NR            |
| 445    | 72751         | NR            | 575    | 130476        | NR            | 705    | 13322         | NR            | 835    | 2625          | NR            | 965    | 1982          | NR            |
| 450    | 65091         | NR            | 580    | 137926        | NR            | 710    | 11676         | NR            | 840    | 2754          | NR            | 970    | 3613          | NR            |
| 455    | 44894         | NR            | 585    | 143406        | NR            | 715    | 10626         | NR            | 845    | 2708          | NR            | 975    | 4034          | NR            |
| 460    | 32712         | NR            | 590    | 147039        | NR            | 720    | 9416          | NR            | 850    | 2608          | NR            | 980    | 3922          | NR            |
| 465    | 25296         | NR            | 595    | 147365        | NR            | 725    | 8333          | NR            | 855    | 2605          | NR            | 985    | 1909          | NR            |
| 470    | 19318         | NR            | 600    | 145800        | NR            | 730    | 7134          | NR            | 860    | 1765          | NR            | 990    | 3617          | NR            |
| 475    | 17265         | NR            | 605    | 141363        | NR            | 735    | 6437          | NR            | 865    | 2581          | NR            | 995    | 4767          | NR            |
| 480    | 18260         | NR            | 610    | 134199        | NR            | 740    | 5834          | NR            | 870    | 3016          | NR            | 1000   | 2528          | NR            |
| 485    | 20845         | NR            | 615    | 127683        | NR            | 745    | 5500          | NR            | 875    | 3952          | NR            |        |               |               |

REPORT NUMBER: SP1-1908-441-2-R4

Scotopic Flux vs. Wavelength



Scotopic Lumens: 8494.8

S/P: 1.23

| $\lambda$<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               | 2397                                 | NR                             | 490               | 24908                                | NR                             | 620               | 118784                               | NR                             | 750               | 5037                                 | NR                             | 880               | 2677                                 | NR                             |
| 365               | 2084                                 | NR                             | 495               | 30998                                | NR                             | 625               | 108951                               | NR                             | 755               | 4413                                 | NR                             | 885               | 2940                                 | NR                             |
| 370               | 2143                                 | NR                             | 500               | 37103                                | NR                             | 630               | 99573                                | NR                             | 760               | 4189                                 | NR                             | 890               | 3116                                 | NR                             |
| 375               | 2413                                 | NR                             | 505               | 42987                                | NR                             | 635               | 90444                                | NR                             | 765               | 3677                                 | NR                             | 895               | 3345                                 | NR                             |
| 380               | 2172                                 | NR                             | 510               | 48702                                | NR                             | 640               | 80749                                | NR                             | 770               | 3366                                 | NR                             | 900               | 2312                                 | NR                             |
| 385               | 1997                                 | NR                             | 515               | 53741                                | NR                             | 645               | 71664                                | NR                             | 775               | 3211                                 | NR                             | 905               | 2829                                 | NR                             |
| 390               | 1830                                 | NR                             | 520               | 57283                                | NR                             | 650               | 63936                                | NR                             | 780               | 2682                                 | NR                             | 910               | 2783                                 | NR                             |
| 395               | 1861                                 | NR                             | 525               | 61876                                | NR                             | 655               | 56611                                | NR                             | 785               | 2804                                 | NR                             | 915               | 2662                                 | NR                             |
| 400               | 1717                                 | NR                             | 530               | 65398                                | NR                             | 660               | 49763                                | NR                             | 790               | 2581                                 | NR                             | 920               | 3047                                 | NR                             |
| 405               | 1761                                 | NR                             | 535               | 69597                                | NR                             | 665               | 42891                                | NR                             | 795               | 2711                                 | NR                             | 925               | 2256                                 | NR                             |
| 410               | 2680                                 | NR                             | 540               | 74214                                | NR                             | 670               | 36939                                | NR                             | 800               | 2609                                 | NR                             | 930               | 2976                                 | NR                             |
| 415               | 4374                                 | NR                             | 545               | 79911                                | NR                             | 675               | 31946                                | NR                             | 805               | 2581                                 | NR                             | 935               | 3503                                 | NR                             |
| 420               | 8071                                 | NR                             | 550               | 86153                                | NR                             | 680               | 27385                                | NR                             | 810               | 2404                                 | NR                             | 940               | 4226                                 | NR                             |
| 425               | 15169                                | NR                             | 555               | 93952                                | NR                             | 685               | 23504                                | NR                             | 815               | 2556                                 | NR                             | 945               | 2930                                 | NR                             |
| 430               | 26038                                | NR                             | 560               | 102904                               | NR                             | 690               | 20210                                | NR                             | 820               | 2742                                 | NR                             | 950               | 2115                                 | NR                             |
| 435               | 41316                                | NR                             | 565               | 112009                               | NR                             | 695               | 17459                                | NR                             | 825               | 2014                                 | NR                             | 955               | 2634                                 | NR                             |
| 440               | 59674                                | NR                             | 570               | 121662                               | NR                             | 700               | 15207                                | NR                             | 830               | 2488                                 | NR                             | 960               | 4200                                 | NR                             |
| 445               | 72751                                | NR                             | 575               | 130476                               | NR                             | 705               | 13322                                | NR                             | 835               | 2625                                 | NR                             | 965               | 1982                                 | NR                             |
| 450               | 65091                                | NR                             | 580               | 137926                               | NR                             | 710               | 11676                                | NR                             | 840               | 2754                                 | NR                             | 970               | 3613                                 | NR                             |
| 455               | 44894                                | NR                             | 585               | 143406                               | NR                             | 715               | 10626                                | NR                             | 845               | 2708                                 | NR                             | 975               | 4034                                 | NR                             |
| 460               | 32712                                | NR                             | 590               | 147039                               | NR                             | 720               | 9416                                 | NR                             | 850               | 2608                                 | NR                             | 980               | 3922                                 | NR                             |
| 465               | 25296                                | NR                             | 595               | 147365                               | NR                             | 725               | 8333                                 | NR                             | 855               | 2605                                 | NR                             | 985               | 1909                                 | NR                             |
| 470               | 19318                                | NR                             | 600               | 145800                               | NR                             | 730               | 7134                                 | NR                             | 860               | 1765                                 | NR                             | 990               | 3617                                 | NR                             |
| 475               | 17265                                | NR                             | 605               | 141363                               | NR                             | 735               | 6437                                 | NR                             | 865               | 2581                                 | NR                             | 995               | 4767                                 | NR                             |
| 480               | 18260                                | NR                             | 610               | 134199                               | NR                             | 740               | 5834                                 | NR                             | 870               | 3016                                 | NR                             | 1000              | 2528                                 | NR                             |
| 485               | 20845                                | NR                             | 615               | 127683                               | NR                             | 745               | 5500                                 | NR                             | 875               | 3952                                 | NR                             |                   |                                      |                                |

REPORT NUMBER: SP1-1908-441-2-R4

**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: 3101.5 M/P: 0.45**

| $\lambda$ (nm) | Power ( $\mu\text{W}/\text{nm}$ ) | Lumens ( $\phi/\text{nm}$ ) | $\lambda$ (nm) | Power ( $\mu\text{W}/\text{nm}$ ) | Lumens ( $\phi/\text{nm}$ ) | $\lambda$ (nm) | Power ( $\mu\text{W}/\text{nm}$ ) | Lumens ( $\phi/\text{nm}$ ) | $\lambda$ (nm) | Power ( $\mu\text{W}/\text{nm}$ ) | Lumens ( $\phi/\text{nm}$ ) | $\lambda$ (nm) | Power ( $\mu\text{W}/\text{nm}$ ) | Lumens ( $\phi/\text{nm}$ ) |
|----------------|-----------------------------------|-----------------------------|----------------|-----------------------------------|-----------------------------|----------------|-----------------------------------|-----------------------------|----------------|-----------------------------------|-----------------------------|----------------|-----------------------------------|-----------------------------|
| 360            | 2397                              | NR                          | 490            | 24908                             | NR                          | 620            | 118784                            | NR                          | 750            | 5037                              | NR                          | 880            | 2677                              | NR                          |
| 365            | 2084                              | NR                          | 495            | 30998                             | NR                          | 625            | 108951                            | NR                          | 755            | 4413                              | NR                          | 885            | 2940                              | NR                          |
| 370            | 2143                              | NR                          | 500            | 37103                             | NR                          | 630            | 99573                             | NR                          | 760            | 4189                              | NR                          | 890            | 3116                              | NR                          |
| 375            | 2413                              | NR                          | 505            | 42987                             | NR                          | 635            | 90444                             | NR                          | 765            | 3677                              | NR                          | 895            | 3345                              | NR                          |
| 380            | 2172                              | NR                          | 510            | 48702                             | NR                          | 640            | 80749                             | NR                          | 770            | 3366                              | NR                          | 900            | 2312                              | NR                          |
| 385            | 1997                              | NR                          | 515            | 53741                             | NR                          | 645            | 71664                             | NR                          | 775            | 3211                              | NR                          | 905            | 2829                              | NR                          |
| 390            | 1830                              | NR                          | 520            | 57283                             | NR                          | 650            | 63936                             | NR                          | 780            | 2682                              | NR                          | 910            | 2783                              | NR                          |
| 395            | 1861                              | NR                          | 525            | 61876                             | NR                          | 655            | 56611                             | NR                          | 785            | 2804                              | NR                          | 915            | 2662                              | NR                          |
| 400            | 1717                              | NR                          | 530            | 65398                             | NR                          | 660            | 49763                             | NR                          | 790            | 2581                              | NR                          | 920            | 3047                              | NR                          |
| 405            | 1761                              | NR                          | 535            | 69597                             | NR                          | 665            | 42891                             | NR                          | 795            | 2711                              | NR                          | 925            | 2256                              | NR                          |
| 410            | 2680                              | NR                          | 540            | 74214                             | NR                          | 670            | 36939                             | NR                          | 800            | 2609                              | NR                          | 930            | 2976                              | NR                          |
| 415            | 4374                              | NR                          | 545            | 79911                             | NR                          | 675            | 31946                             | NR                          | 805            | 2581                              | NR                          | 935            | 3503                              | NR                          |
| 420            | 8071                              | NR                          | 550            | 86153                             | NR                          | 680            | 27385                             | NR                          | 810            | 2404                              | NR                          | 940            | 4226                              | NR                          |
| 425            | 15169                             | NR                          | 555            | 93952                             | NR                          | 685            | 23504                             | NR                          | 815            | 2556                              | NR                          | 945            | 2930                              | NR                          |
| 430            | 26038                             | NR                          | 560            | 102904                            | NR                          | 690            | 20210                             | NR                          | 820            | 2742                              | NR                          | 950            | 2115                              | NR                          |
| 435            | 41316                             | NR                          | 565            | 112009                            | NR                          | 695            | 17459                             | NR                          | 825            | 2014                              | NR                          | 955            | 2634                              | NR                          |
| 440            | 59674                             | NR                          | 570            | 121662                            | NR                          | 700            | 15207                             | NR                          | 830            | 2488                              | NR                          | 960            | 4200                              | NR                          |
| 445            | 72751                             | NR                          | 575            | 130476                            | NR                          | 705            | 13322                             | NR                          | 835            | 2625                              | NR                          | 965            | 1982                              | NR                          |
| 450            | 65091                             | NR                          | 580            | 137926                            | NR                          | 710            | 11676                             | NR                          | 840            | 2754                              | NR                          | 970            | 3613                              | NR                          |
| 455            | 44894                             | NR                          | 585            | 143406                            | NR                          | 715            | 10626                             | NR                          | 845            | 2708                              | NR                          | 975            | 4034                              | NR                          |
| 460            | 32712                             | NR                          | 590            | 147039                            | NR                          | 720            | 9416                              | NR                          | 850            | 2608                              | NR                          | 980            | 3922                              | NR                          |
| 465            | 25296                             | NR                          | 595            | 147365                            | NR                          | 725            | 8333                              | NR                          | 855            | 2605                              | NR                          | 985            | 1909                              | NR                          |
| 470            | 19318                             | NR                          | 600            | 145800                            | NR                          | 730            | 7134                              | NR                          | 860            | 1765                              | NR                          | 990            | 3617                              | NR                          |
| 475            | 17265                             | NR                          | 605            | 141363                            | NR                          | 735            | 6437                              | NR                          | 865            | 2581                              | NR                          | 995            | 4767                              | NR                          |
| 480            | 18260                             | NR                          | 610            | 134199                            | NR                          | 740            | 5834                              | NR                          | 870            | 3016                              | NR                          | 1000           | 2528                              | NR                          |
| 485            | 20845                             | NR                          | 615            | 127683                            | NR                          | 745            | 5500                              | NR                          | 875            | 3952                              | NR                          |                |                                   |                             |

REPORT NUMBER: SP1-1908-441-2-R4

TM-30-18

**Summary**

$R_f = 75.7$   
 $R_g = 93.9$   
 CIE  $R_a = 71.8$   
 $R_9 = -38.3$



**Color Vector Graphics**





REPORT NUMBER: SP1-1908-441-2-R4

TM-30-18

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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 67 | CES51 = 87 | CES76 = 63 |
| CES02 = 63 | CES27 = 88 | CES52 = 86 | CES77 = 80 |
| CES03 = 31 | CES28 = 87 | CES53 = 78 | CES78 = 67 |
| CES04 = 71 | CES29 = 66 | CES54 = 84 | CES79 = 87 |
| CES05 = 49 | CES30 = 73 | CES55 = 84 | CES80 = 86 |
| CES06 = 51 | CES31 = 70 | CES56 = 75 | CES81 = 71 |
| CES07 = 41 | CES32 = 65 | CES57 = 74 | CES82 = 94 |
| CES08 = 40 | CES33 = 73 | CES58 = 76 | CES83 = 90 |
| CES09 = 29 | CES34 = 79 | CES59 = 85 | CES84 = 89 |
| CES10 = 76 | CES35 = 89 | CES60 = 93 | CES85 = 77 |
| CES11 = 59 | CES36 = 97 | CES61 = 84 | CES86 = 61 |
| CES12 = 65 | CES37 = 87 | CES62 = 91 | CES87 = 78 |
| CES13 = 43 | CES38 = 81 | CES63 = 77 | CES88 = 77 |
| CES14 = 74 | CES39 = 95 | CES64 = 72 | CES89 = 67 |
| CES15 = 71 | CES40 = 92 | CES65 = 68 | CES90 = 76 |
| CES16 = 47 | CES41 = 88 | CES66 = 69 | CES91 = 89 |
| CES17 = 50 | CES42 = 89 | CES67 = 67 | CES92 = 58 |
| CES18 = 56 | CES43 = 79 | CES68 = 72 | CES93 = 74 |
| CES19 = 73 | CES44 = 99 | CES69 = 81 | CES94 = 49 |
| CES20 = 66 | CES45 = 85 | CES70 = 66 | CES95 = 68 |
| CES21 = 87 | CES46 = 80 | CES71 = 67 | CES96 = 76 |
| CES22 = 79 | CES47 = 82 | CES72 = 88 | CES97 = 82 |
| CES23 = 92 | CES48 = 69 | CES73 = 59 | CES98 = 75 |
| CES24 = 91 | CES49 = 80 | CES74 = 95 | CES99 = 62 |
| CES25 = 73 | CES50 = 87 | CES75 = 69 |            |



REPORT NUMBER: SP1-1908-441-2-R4

TM-30-18

Color Rendition by Hue-Angle Bin



REPORT NUMBER: SP1-1908-441-2-R4

TM-30-18

Measure Comparisons



(END OF REPORT)