

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: P643549

Luminaire Tested: GWS-SA6F-727-U-T2-W-GRSWH

Issue Date: 1/10/2023

**Test Information**

Test Method: LM-79-2019  
Report Number: P643549  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2209-782-21)  
Test Lab: COOPER LIGHTING SOLUTIONS  
Issue Date: 1/10/2023  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: McGRAW-EDISON  
Catalog Number: GWS-SA6F-727-U-T2-W-GRSWH  
Description: GALLEON WALL SLIM LUMINAIRE. (6) LIGHTSQUARES WITH 16 LEDS EACH AND TYPE II OPTICS W/ FACTORY INSALLED GLARE SHIELD, WH  
Light Source: (96) 2700K CCT, 70 CRI LEDS  
Ballast/Driver: -

**Summary**

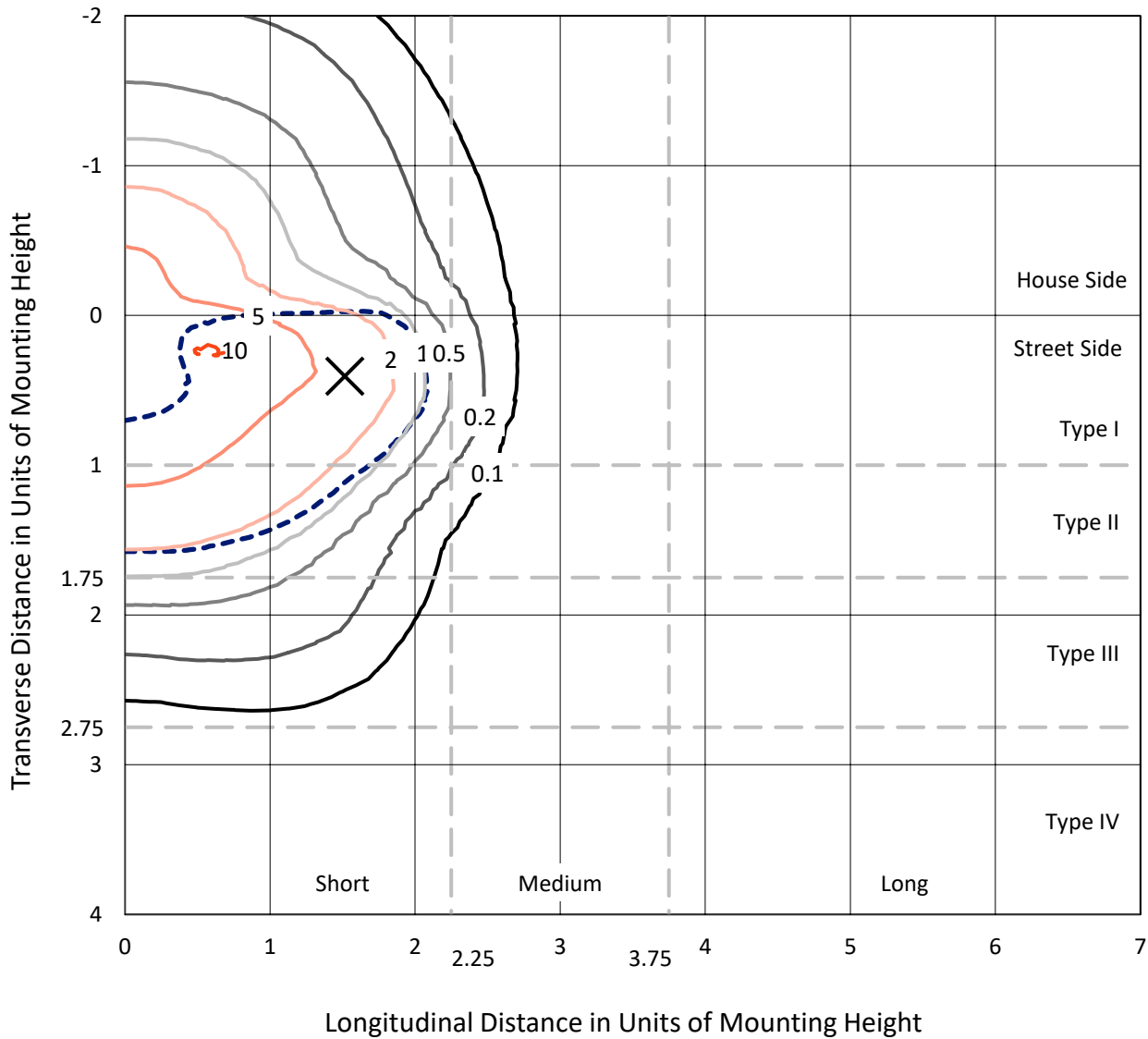
Lumens per Lamp: N/A  
Luminaire Lumens: 34701.6 lumens  
Efficiency: N/A  
Efficacy: 93.1 lumens/watt  
Luminous Opening: Rectangular (W 2' x L: 1' x H: 0')  
IES Classification: Type II - Short  
BUG Rating: B3 - U0 - G3  
  
Input Watts (W): 372.6  
Input Voltage (V): 120  
Input Current (Ain): NR  
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: P643549  
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### Iso-Footcandle Lines of Horizontal Illumination

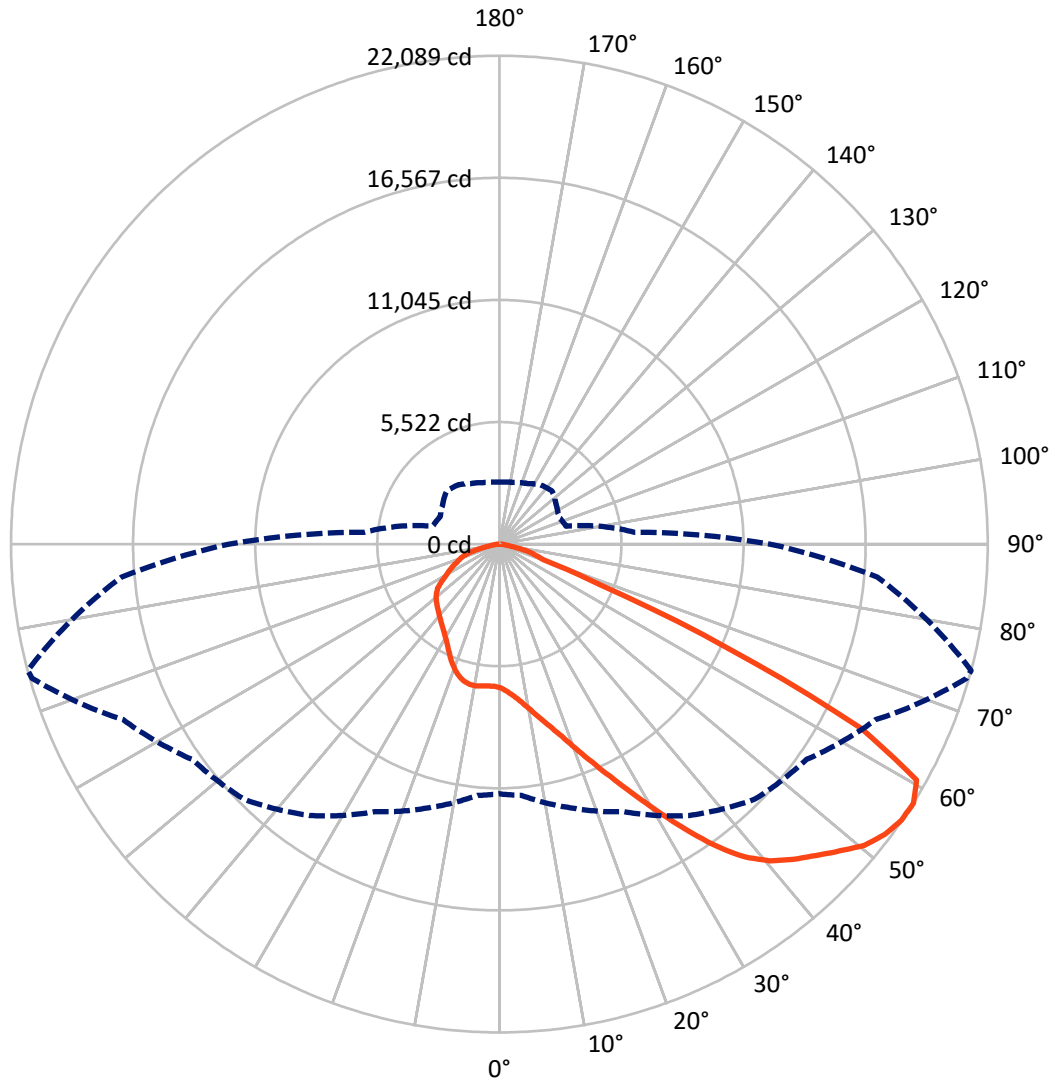
✕ Max cd  
 - - - 1/2 Max cd



Based on 30 foot mounting height. Maximum calculated value = 10.2 fc  
 Type II - Short - N/A

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### Luminous Intensity Polar Plot



— Vertical Plane Through 75-Deg Lateral    - - - Horizontal Cone Through 57.5-Deg Vertical

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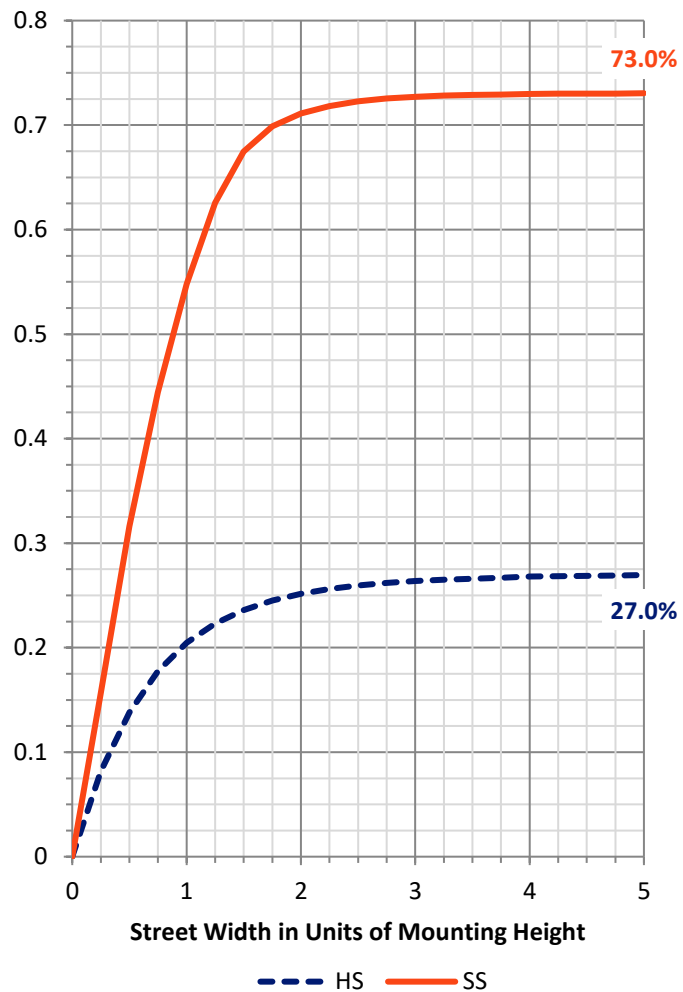
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 9387.5   | 0.0    | 9387.5  |
|                    | % Fixture | 27.1     | 0.0    | 27.1    |
| <b>Street Side</b> | Lumens    | 25314.1  | 0.0    | 25314.1 |
|                    | % Fixture | 72.9     | 0.0    | 72.9    |
| <b>Total</b>       | Lumens    | 34701.6  | 0.0    | 34701.6 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 650.3   | 1.9       |
| 10°-20°   | 2070.5  | 6.0       |
| 20°-30°   | 3672.0  | 10.6      |
| 30°-40°   | 5621.2  | 16.2      |
| 40°-50°   | 7827.1  | 22.6      |
| 50°-60°   | 8968.3  | 25.8      |
| 60°-70°   | 4608.1  | 13.3      |
| 70°-80°   | 1160.1  | 3.3       |
| 80°-90°   | 124.0   | 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°    | 34701.6 | 100.0     |
| 0°-180°   | 34701.6 | 100.0     |

**Coefficient of Utilization**



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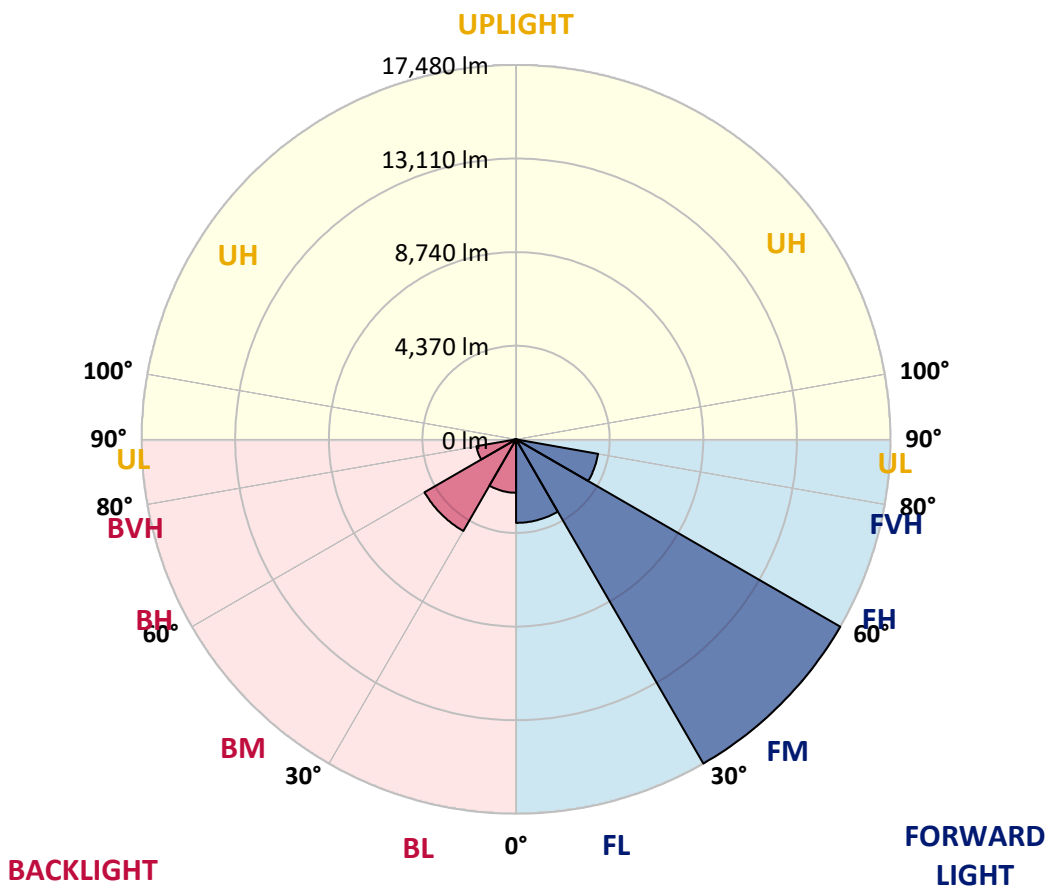
CATALOG NUMBER: GWS-SA6F-727-U-T2-W-GRSWH

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

| Zone           | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |         |
|----------------|---------|-----------|-------------------------|------|---------|
|                |         |           | B                       | U    | G       |
| FL (0°-30°)    | 3898.9  | 11.2      |                         |      |         |
| FM (30°-60°)   | 17479.6 | 50.4      |                         |      |         |
| FH (60°-80°)   | 3889.7  | 11.2      |                         |      | G2/5000 |
| FVH (80°-90°)  | 45.9    | 0.1       |                         |      | G1/100  |
| BL (0°-30°)    | 2493.9  | 7.2       | B3/2500                 |      |         |
| BM (30°-60°)   | 4937.0  | 14.2      | B3/5000                 |      |         |
| BH (60°-80°)   | 1878.5  | 5.4       | B3/2500                 |      | G3/2500 |
| BVH (80°-90°)  | 78.1    | 0.2       |                         |      | 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





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 45°     | 55°     | 65°     | 74°     | 75°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 6498.8  | 6498.8  | 6498.8  | 6498.8  | 6498.8  | 6498.8  | 6498.8  | 6498.8  | 6498.8  | 6498.8  | 6498.8  |
| 2.5°  | 6982.2  | 7000.1  | 6982.2  | 7012.0  | 6952.3  | 6925.5  | 6859.8  | 6761.4  | 6683.8  | 6671.8  | 6585.3  |
| 5°    | 7525.2  | 7564.0  | 7540.1  | 7528.2  | 7447.6  | 7388.0  | 7289.5  | 7092.6  | 6931.4  | 6907.6  | 6737.5  |
| 7.5°  | 7874.3  | 7901.2  | 7901.2  | 7910.1  | 7880.3  | 7811.7  | 7707.2  | 7474.5  | 7247.7  | 7211.9  | 6955.3  |
| 10°   | 7990.7  | 8011.6  | 8050.4  | 8125.0  | 8184.6  | 8205.5  | 8136.9  | 7913.1  | 7635.6  | 7599.8  | 7241.7  |
| 12.5° | 8017.5  | 8041.4  | 8101.1  | 8238.3  | 8402.5  | 8551.7  | 8563.6  | 8399.5  | 8089.2  | 8050.4  | 7573.0  |
| 15°   | 8068.3  | 8092.1  | 8172.7  | 8342.8  | 8584.5  | 8870.9  | 9047.0  | 8933.6  | 8590.4  | 8548.7  | 7948.9  |
| 17.5° | 8062.3  | 8089.2  | 8208.5  | 8435.3  | 8760.5  | 9175.3  | 9515.4  | 9563.2  | 9208.1  | 9136.5  | 8375.6  |
| 20°   | 8047.4  | 8071.3  | 8199.6  | 8477.1  | 8879.9  | 9449.8  | 10064.5 | 10312.1 | 9930.2  | 9864.5  | 8873.9  |
| 22.5° | 8166.7  | 8193.6  | 8292.1  | 8521.8  | 8942.5  | 9661.6  | 10571.7 | 11168.5 | 10786.5 | 10694.0 | 9446.8  |
| 25°   | 8435.3  | 8474.1  | 8533.7  | 8691.9  | 9055.9  | 9849.6  | 11090.9 | 12138.2 | 11747.3 | 11636.9 | 10070.4 |
| 27.5° | 8850.0  | 8897.8  | 8981.3  | 9055.9  | 9309.5  | 10088.3 | 11607.1 | 13224.3 | 12833.4 | 12717.1 | 10729.8 |
| 30°   | 9357.3  | 9419.9  | 9527.4  | 9578.1  | 9751.1  | 10440.4 | 12168.0 | 14343.3 | 14116.5 | 13955.4 | 11472.8 |
| 32.5° | 10058.5 | 10145.0 | 10246.5 | 10261.4 | 10365.8 | 10974.5 | 12723.0 | 15453.2 | 15450.3 | 15336.9 | 12317.2 |
| 35°   | 10971.5 | 11064.0 | 11084.9 | 11105.8 | 11156.5 | 11708.5 | 13394.4 | 16464.8 | 16855.6 | 16724.4 | 13236.3 |
| 37.5° | 11968.1 | 12102.4 | 12135.2 | 12042.7 | 12114.3 | 12591.8 | 14149.3 | 17276.4 | 18079.0 | 17938.8 | 14125.4 |
| 40°   | 13033.4 | 13087.1 | 13176.6 | 13030.4 | 13119.9 | 13603.3 | 14889.3 | 17795.5 | 18992.1 | 18842.9 | 14826.6 |
| 42.5° | 13797.2 | 13895.7 | 14030.0 | 13976.2 | 14027.0 | 14468.6 | 15408.5 | 18046.2 | 19642.5 | 19493.3 | 15330.9 |
| 45°   | 14626.7 | 14656.6 | 14743.1 | 14731.2 | 14761.0 | 15172.8 | 15781.5 | 18156.6 | 20224.4 | 20090.1 | 15760.6 |
| 47.5° | 15348.8 | 15393.6 | 15450.3 | 15384.6 | 15319.0 | 15587.5 | 16085.8 | 18252.1 | 20895.7 | 20734.6 | 16211.1 |
| 50°   | 16044.0 | 16082.8 | 16151.5 | 15960.5 | 15715.8 | 15784.4 | 16235.0 | 18383.4 | 21525.3 | 21411.9 | 16566.2 |
| 52.5° | 16172.3 | 16214.1 | 16536.4 | 16575.2 | 16261.9 | 16020.2 | 16497.6 | 18672.8 | 21895.3 | 21823.7 | 16694.5 |
| 55°   | 14558.1 | 14632.7 | 15274.2 | 16011.2 | 16784.0 | 16706.5 | 16918.3 | 18825.0 | 22041.5 | 22059.4 | 16924.3 |
| 57.5° | 11299.8 | 11407.2 | 12344.1 | 13355.6 | 14981.8 | 16327.5 | 16972.0 | 18786.2 | 21990.8 | 22089.3 | 17160.0 |
| 60°   | 7411.8  | 7474.5  | 8584.5  | 9718.3  | 11404.2 | 13266.1 | 15190.7 | 18088.0 | 21540.3 | 21680.5 | 17100.3 |
| 62.5° | 4475.7  | 4547.4  | 5439.5  | 6298.9  | 7292.5  | 8536.7  | 10303.2 | 14537.2 | 18055.1 | 18368.4 | 13695.8 |
| 65°   | 3124.1  | 3219.6  | 4001.3  | 4708.5  | 5051.6  | 4795.0  | 5218.7  | 8119.0  | 11249.0 | 11380.3 | 8369.6  |
| 67.5° | 2264.7  | 2330.4  | 2971.9  | 3813.3  | 4192.3  | 3386.6  | 2581.0  | 3595.5  | 4899.4  | 4947.2  | 3452.3  |
| 70°   | 1483.0  | 1557.6  | 2139.4  | 2903.3  | 3422.5  | 2745.1  | 1930.5  | 1945.5  | 2061.8  | 2085.7  | 2005.1  |
| 72.5° | 814.6   | 859.3   | 1321.8  | 1927.6  | 2023.0  | 1641.1  | 1506.8  | 1617.2  | 1697.8  | 1697.8  | 1718.7  |
| 75°   | 420.7   | 459.5   | 540.1   | 635.6   | 766.8   | 898.1   | 1086.1  | 1250.2  | 1336.8  | 1342.7  | 1333.8  |
| 77.5° | 214.8   | 229.8   | 289.4   | 313.3   | 343.1   | 399.8   | 519.2   | 665.4   | 743.0   | 772.8   | 766.8   |
| 80°   | 101.5   | 107.4   | 122.3   | 143.2   | 176.0   | 223.8   | 280.5   | 334.2   | 381.9   | 387.9   | 420.7   |
| 82.5° | 53.7    | 59.7    | 65.6    | 77.6    | 95.5    | 119.4   | 164.1   | 196.9   | 226.8   | 232.7   | 259.6   |
| 85°   | 20.9    | 23.9    | 26.9    | 29.8    | 41.8    | 50.7    | 68.6    | 92.5    | 113.4   | 113.4   | 134.3   |
| 87.5° | 0.0     | 0.0     | 0.0     | 0.0     | 3.0     | 6.0     | 11.9    | 14.9    | 20.9    | 20.9    | 35.8    |
| 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: P643549

CATALOG NUMBER: GWS-SA6F-727-U-T2-W-GRSWH

**CANDELA DISTRIBUTION (continued):**

|       | 90°     | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 6498.8  | 6498.8 | 6498.8 | 6498.8 | 6498.8 | 6498.8 | 6498.8 | 6498.8 | 6498.8 | 6498.8 | 6498.8 |
| 2.5°  | 6564.4  | 6477.9 | 6439.1 | 6376.4 | 6325.7 | 6269.0 | 6224.3 | 6191.4 | 6170.6 | 6158.6 | 6146.7 |
| 5°    | 6671.8  | 6540.6 | 6436.1 | 6310.8 | 6224.3 | 6140.7 | 6072.1 | 6024.3 | 6000.5 | 5982.6 | 5970.6 |
| 7.5°  | 6838.9  | 6662.9 | 6466.0 | 6272.0 | 6119.8 | 5985.6 | 5899.0 | 5848.3 | 5815.5 | 5803.5 | 5794.6 |
| 10°   | 7068.7  | 6824.0 | 6498.8 | 6191.4 | 5964.7 | 5818.5 | 5758.8 | 5734.9 | 5737.9 | 5731.9 | 5728.9 |
| 12.5° | 7328.3  | 6994.1 | 6489.8 | 6048.2 | 5797.6 | 5711.0 | 5714.0 | 5752.8 | 5797.6 | 5809.5 | 5812.5 |
| 15°   | 7608.8  | 7161.2 | 6403.3 | 5863.2 | 5666.3 | 5675.2 | 5752.8 | 5845.3 | 5928.9 | 5961.7 | 5967.7 |
| 17.5° | 7913.1  | 7301.4 | 6245.2 | 5660.3 | 5558.9 | 5654.4 | 5797.6 | 5949.8 | 6072.1 | 6125.8 | 6140.7 |
| 20°   | 8253.3  | 7420.8 | 6021.4 | 5460.4 | 5457.4 | 5615.6 | 5824.4 | 6024.3 | 6179.5 | 6251.1 | 6263.1 |
| 22.5° | 8614.3  | 7495.4 | 5746.9 | 5275.4 | 5353.0 | 5564.8 | 5803.5 | 6012.4 | 6176.5 | 6248.1 | 6263.1 |
| 25°   | 8978.3  | 7519.2 | 5445.5 | 5105.3 | 5245.6 | 5484.3 | 5702.1 | 5869.2 | 6024.3 | 6087.0 | 6098.9 |
| 27.5° | 9318.5  | 7450.6 | 5159.0 | 4959.1 | 5147.1 | 5364.9 | 5511.1 | 5600.6 | 5708.1 | 5755.8 | 5764.8 |
| 30°   | 9664.6  | 7313.4 | 4917.3 | 4842.8 | 5036.7 | 5200.8 | 5266.5 | 5272.4 | 5314.2 | 5314.2 | 5320.2 |
| 32.5° | 10013.7 | 7110.5 | 4705.5 | 4729.4 | 4899.4 | 5006.9 | 5015.8 | 4947.2 | 4896.5 | 4812.9 | 4809.9 |
| 35°   | 10416.5 | 6904.6 | 4532.4 | 4601.1 | 4738.3 | 4804.0 | 4777.1 | 4645.8 | 4523.5 | 4386.2 | 4380.3 |
| 37.5° | 10789.5 | 6692.7 | 4386.2 | 4469.8 | 4556.3 | 4604.0 | 4541.4 | 4383.2 | 4281.8 | 4141.6 | 4120.7 |
| 40°   | 11096.9 | 6501.8 | 4246.0 | 4332.5 | 4374.3 | 4416.1 | 4314.6 | 4186.3 | 4201.2 | 4123.6 | 4120.7 |
| 42.5° | 11275.9 | 6316.8 | 4114.7 | 4180.3 | 4207.2 | 4237.0 | 4147.5 | 4052.0 | 4132.6 | 4072.9 | 4075.9 |
| 45°   | 11407.2 | 6155.6 | 3995.3 | 4019.2 | 4084.9 | 4129.6 | 4046.1 | 3938.7 | 3956.6 | 3726.8 | 3673.1 |
| 47.5° | 11556.4 | 6066.1 | 3882.0 | 3858.1 | 3974.5 | 4052.0 | 3923.7 | 3768.6 | 3661.2 | 3434.4 | 3413.5 |
| 50°   | 11714.5 | 6033.3 | 3762.6 | 3697.0 | 3837.2 | 3911.8 | 3762.6 | 3568.7 | 3428.4 | 3306.1 | 3294.1 |
| 52.5° | 11768.2 | 6030.3 | 3613.4 | 3503.0 | 3643.3 | 3747.7 | 3622.4 | 3425.4 | 3258.3 | 3139.0 | 3133.0 |
| 55°   | 11980.1 | 6116.8 | 3422.5 | 3237.5 | 3368.7 | 3583.6 | 3491.1 | 3207.6 | 3073.3 | 3019.6 | 3013.7 |
| 57.5° | 12227.7 | 6131.8 | 3121.1 | 2948.0 | 3130.0 | 3383.7 | 3267.3 | 3022.6 | 2876.4 | 2810.8 | 2804.8 |
| 60°   | 12126.3 | 5764.8 | 2798.8 | 2727.2 | 2927.1 | 3195.7 | 3088.3 | 2876.4 | 2706.3 | 2643.7 | 2637.7 |
| 62.5° | 9240.9  | 4069.9 | 2563.1 | 2536.3 | 2709.3 | 2924.2 | 2903.3 | 2682.5 | 2521.3 | 2476.6 | 2470.6 |
| 65°   | 5558.9  | 2858.5 | 2336.3 | 2333.4 | 2455.7 | 2661.6 | 2688.4 | 2509.4 | 2339.3 | 2276.7 | 2276.7 |
| 67.5° | 2748.1  | 2187.1 | 2079.7 | 2064.8 | 2142.4 | 2288.6 | 2402.0 | 2255.8 | 2112.5 | 2052.9 | 2043.9 |
| 70°   | 1942.5  | 1927.6 | 1891.7 | 1850.0 | 1864.9 | 1924.6 | 1972.3 | 1850.0 | 1697.8 | 1638.1 | 1626.2 |
| 72.5° | 1679.9  | 1682.9 | 1659.0 | 1626.2 | 1614.3 | 1572.5 | 1530.7 | 1441.2 | 1348.7 | 1286.0 | 1292.0 |
| 75°   | 1303.9  | 1309.9 | 1324.8 | 1312.9 | 1280.1 | 1235.3 | 1190.5 | 1077.2 | 1002.6 | 942.9  | 931.0  |
| 77.5° | 760.9   | 790.7  | 838.5  | 826.5  | 832.5  | 769.8  | 751.9  | 641.5  | 572.9  | 531.1  | 522.2  |
| 80°   | 429.7   | 447.6  | 468.5  | 483.4  | 465.5  | 438.6  | 399.8  | 340.2  | 319.3  | 289.4  | 283.5  |
| 82.5° | 259.6   | 277.5  | 286.4  | 298.4  | 292.4  | 256.6  | 226.8  | 188.0  | 170.1  | 155.2  | 152.2  |
| 85°   | 131.3   | 143.2  | 152.2  | 158.1  | 140.2  | 116.4  | 104.4  | 83.5   | 71.6   | 62.7   | 62.7   |
| 87.5° | 32.8    | 35.8   | 41.8   | 35.8   | 32.8   | 14.9   | 11.9   | 3.0    | 0.0    | 0.0    | 0.0    |
| 90°   | 0.0     | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |



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

Report Prepared for

Cooper Lighting Solutions

McGRAW-EDISON

Report Number: SP1-1908-441-1-R4

Test Date: 08/20/2019

Luminaire Tested: SA1C-727-U-5WQ

**Test Information**

Test Method: LM-79-2008  
 Report Number: SP1-1908-441-1-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-727-U-5WQ**  
 Description: McGRAW EDISON ROADWAY AND AREA LUMINAIRE

\*\*\*THIS IS A REVISION OF SP1-1908-441-1-R3. TO UPDATE THE CATALOG NUMBER.\*\*\*TESTED IN SITU. (1) 70 CRI, 2700K, 1050MA LIGHTSQUARE WITH 16 LEDS AND TYPE V WIDE OPTICS.

**Spectral Parameters**

CCT (K): 2741  
 CIE u': 0.2605  
 CIE v': 0.5272  
 Duv: 0.0005  
 CIE x: 0.4573  
 CIE y: 0.4113  
 CIE z: 0.1313  
 Peak Wavelength (nm): 602  
 Dominant Wavelength (nm): 583  
 Purity: 61.2

|           |      |      |       |
|-----------|------|------|-------|
| CRI (Ra): | 71.5 |      |       |
| R1:       | 69.2 | R9:  | -16.1 |
| R2:       | 79.4 | R10: | 51.4  |
| R3:       | 87.8 | R11: | 63.1  |
| R4:       | 69.4 | R12: | 42.0  |
| R5:       | 66.4 | R13: | 70.2  |
| R6:       | 69.8 | R14: | 92.4  |
| R7:       | 79.8 |      |       |
| R8:       | 50.1 |      |       |

Rf: 69.9  
 Rg: 98.3



**Test Conditions**

Stabilization Time: 56M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 25.3./42%  
 Sphere Temperature (°C): 25.7

REPORT NUMBER: SP1-1908-441-1-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: SP1-1908-441-1-R4

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: SP1-1908-441-1-R4

**Photopic Flux vs. Wavelength**



**Photopic Lumens: 6211.7**

| $\lambda$ (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            | 2044                              | 0.0                         | 490            | 7179                              | 1.0                         | 620            | 118034                            | 30.7                        | 750            | 8362                              | 0.0                         | 880            | 3128                              | 0.0                         |
| 365            | 2016                              | 0.0                         | 495            | 10476                             | 1.9                         | 625            | 111884                            | 24.7                        | 755            | 7635                              | 0.0                         | 885            | 3110                              | 0.0                         |
| 370            | 2020                              | 0.0                         | 500            | 15549                             | 3.4                         | 630            | 106119                            | 19.2                        | 760            | 6582                              | 0.0                         | 890            | 2632                              | 0.0                         |
| 375            | 2137                              | 0.0                         | 505            | 22477                             | 6.3                         | 635            | 99706                             | 15.0                        | 765            | 5777                              | 0.0                         | 895            | 2709                              | 0.0                         |
| 380            | 2046                              | 0.0                         | 510            | 30417                             | 10.4                        | 640            | 92142                             | 11.0                        | 770            | 5474                              | 0.0                         | 900            | 2016                              | 0.0                         |
| 385            | 1925                              | 0.0                         | 515            | 39274                             | 16.3                        | 645            | 84987                             | 8.2                         | 775            | 4977                              | 0.0                         | 905            | 1748                              | 0.0                         |
| 390            | 1893                              | 0.0                         | 520            | 47282                             | 22.9                        | 650            | 78016                             | 5.7                         | 780            | 4723                              | 0.0                         | 910            | 2046                              | 0.0                         |
| 395            | 1695                              | 0.0                         | 525            | 55413                             | 29.7                        | 655            | 71541                             | 4.1                         | 785            | 4219                              | 0.0                         | 915            | 1844                              | 0.0                         |
| 400            | 1633                              | 0.0                         | 530            | 62377                             | 36.7                        | 660            | 64863                             | 2.7                         | 790            | 3969                              | 0.0                         | 920            | 2734                              | 0.0                         |
| 405            | 2065                              | 0.0                         | 535            | 68520                             | 42.5                        | 665            | 58485                             | 1.9                         | 795            | 4122                              | 0.0                         | 925            | 2307                              | 0.0                         |
| 410            | 3449                              | 0.0                         | 540            | 73435                             | 47.8                        | 670            | 51641                             | 1.1                         | 800            | 2864                              | 0.0                         | 930            | 2039                              | 0.0                         |
| 415            | 7117                              | 0.0                         | 545            | 78677                             | 52.4                        | 675            | 46030                             | 0.8                         | 805            | 3151                              | 0.0                         | 935            | 1784                              | 0.0                         |
| 420            | 13992                             | 0.0                         | 550            | 83331                             | 56.6                        | 680            | 40590                             | 0.5                         | 810            | 3022                              | 0.0                         | 940            | 2464                              | 0.0                         |
| 425            | 25176                             | 0.1                         | 555            | 89120                             | 60.9                        | 685            | 35691                             | 0.3                         | 815            | 3471                              | 0.0                         | 945            | 2794                              | 0.0                         |
| 430            | 38151                             | 0.3                         | 560            | 94613                             | 64.3                        | 690            | 31631                             | 0.2                         | 820            | 2749                              | 0.0                         | 950            | 3090                              | 0.0                         |
| 435            | 49673                             | 0.6                         | 565            | 99818                             | 66.4                        | 695            | 27437                             | 0.1                         | 825            | 2729                              | 0.0                         | 955            | 1866                              | 0.0                         |
| 440            | 57273                             | 0.9                         | 570            | 106526                            | 69.3                        | 700            | 24589                             | 0.1                         | 830            | 2282                              | 0.0                         | 960            | 3110                              | 0.0                         |
| 445            | 54802                             | 1.1                         | 575            | 111610                            | 69.4                        | 705            | 21832                             | 0.0                         | 835            | 3140                              | 0.0                         | 965            | 3880                              | 0.0                         |
| 450            | 39184                             | 1.0                         | 580            | 117163                            | 69.6                        | 710            | 19500                             | 0.0                         | 840            | 2365                              | 0.0                         | 970            | 3243                              | 0.0                         |
| 455            | 22506                             | 0.8                         | 585            | 122201                            | 67.9                        | 715            | 17870                             | 0.0                         | 845            | 3024                              | 0.0                         | 975            | 2014                              | 0.0                         |
| 460            | 13692                             | 0.6                         | 590            | 125662                            | 65.0                        | 720            | 15924                             | 0.0                         | 850            | 2510                              | 0.0                         | 980            | 1688                              | 0.0                         |
| 465            | 9446                              | 0.5                         | 595            | 127415                            | 60.4                        | 725            | 14268                             | 0.0                         | 855            | 2739                              | 0.0                         | 985            | 2827                              | 0.0                         |
| 470            | 6698                              | 0.4                         | 600            | 129155                            | 55.7                        | 730            | 12438                             | 0.0                         | 860            | 3515                              | 0.0                         | 990            | 4172                              | 0.0                         |
| 475            | 5328                              | 0.4                         | 605            | 128057                            | 49.6                        | 735            | 11255                             | 0.0                         | 865            | 3600                              | 0.0                         | 995            | 3177                              | 0.0                         |
| 480            | 5081                              | 0.5                         | 610            | 126031                            | 43.3                        | 740            | 9951                              | 0.0                         | 870            | 3609                              | 0.0                         | 1000           | 3241                              | 0.0                         |
| 485            | 5579                              | 0.7                         | 615            | 123059                            | 37.1                        | 745            | 8870                              | 0.0                         | 875            | 3208                              | 0.0                         |                |                                   |                             |

REPORT NUMBER: SP1-1908-441-1-R4

Scotopic Flux vs. Wavelength



Scotopic Lumens: 6474.3

S/P: 1.04

| 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    | 2044          | 0.0           | 490    | 7179          | 6.0           | 620    | 118034        | 0.1           | 750    | 8362          | 0.0           | 880    | 3128          | 0.0           |
| 365    | 2016          | 0.0           | 495    | 10476         | 8.6           | 625    | 111884        | 0.1           | 755    | 7635          | 0.0           | 885    | 3110          | 0.0           |
| 370    | 2020          | 0.0           | 500    | 15549         | 12.5          | 630    | 106119        | 0.0           | 760    | 6582          | 0.0           | 890    | 2632          | 0.0           |
| 375    | 2137          | 0.0           | 505    | 22477         | 17.3          | 635    | 99706         | 0.0           | 765    | 5777          | 0.0           | 895    | 2709          | 0.0           |
| 380    | 2046          | 0.0           | 510    | 30417         | 21.8          | 640    | 92142         | 0.0           | 770    | 5474          | 0.0           | 900    | 2016          | 0.0           |
| 385    | 1925          | 0.0           | 515    | 39274         | 25.7          | 645    | 84987         | 0.0           | 775    | 4977          | 0.0           | 905    | 1748          | 0.0           |
| 390    | 1893          | 0.0           | 520    | 47282         | 27.5          | 650    | 78016         | 0.0           | 780    | 4723          | 0.0           | 910    | 2046          | 0.0           |
| 395    | 1695          | 0.0           | 525    | 55413         | 28.1          | 655    | 71541         | 0.0           | 785    | 4219          | 0.0           | 915    | 1844          | 0.0           |
| 400    | 1633          | 0.0           | 530    | 62377         | 27.0          | 660    | 64863         | 0.0           | 790    | 3969          | 0.0           | 920    | 2734          | 0.0           |
| 405    | 2065          | 0.0           | 535    | 68520         | 24.7          | 665    | 58485         | 0.0           | 795    | 4122          | 0.0           | 925    | 2307          | 0.0           |
| 410    | 3449          | 0.1           | 540    | 73435         | 21.5          | 670    | 51641         | 0.0           | 800    | 2864          | 0.0           | 930    | 2039          | 0.0           |
| 415    | 7117          | 0.5           | 545    | 78677         | 18.3          | 675    | 46030         | 0.0           | 805    | 3151          | 0.0           | 935    | 1784          | 0.0           |
| 420    | 13992         | 1.6           | 550    | 83331         | 15.0          | 680    | 40590         | 0.0           | 810    | 3022          | 0.0           | 940    | 2464          | 0.0           |
| 425    | 25176         | 3.9           | 555    | 89120         | 12.0          | 685    | 35691         | 0.0           | 815    | 3471          | 0.0           | 945    | 2794          | 0.0           |
| 430    | 38151         | 8.1           | 560    | 94613         | 9.3           | 690    | 31631         | 0.0           | 820    | 2749          | 0.0           | 950    | 3090          | 0.0           |
| 435    | 49673         | 13.3          | 565    | 99818         | 7.0           | 695    | 27437         | 0.0           | 825    | 2729          | 0.0           | 955    | 1866          | 0.0           |
| 440    | 57273         | 19.1          | 570    | 106526        | 5.2           | 700    | 24589         | 0.0           | 830    | 2282          | 0.0           | 960    | 3110          | 0.0           |
| 445    | 54802         | 21.6          | 575    | 111610        | 3.7           | 705    | 21832         | 0.0           | 835    | 3140          | 0.0           | 965    | 3880          | 0.0           |
| 450    | 39184         | 18.1          | 580    | 117163        | 2.6           | 710    | 19500         | 0.0           | 840    | 2365          | 0.0           | 970    | 3243          | 0.0           |
| 455    | 22506         | 11.8          | 585    | 122201        | 1.8           | 715    | 17870         | 0.0           | 845    | 3024          | 0.0           | 975    | 2014          | 0.0           |
| 460    | 13692         | 8.1           | 590    | 125662        | 1.2           | 720    | 15924         | 0.0           | 850    | 2510          | 0.0           | 980    | 1688          | 0.0           |
| 465    | 9446          | 6.2           | 595    | 127415        | 0.8           | 725    | 14268         | 0.0           | 855    | 2739          | 0.0           | 985    | 2827          | 0.0           |
| 470    | 6698          | 4.8           | 600    | 129155        | 0.5           | 730    | 12438         | 0.0           | 860    | 3515          | 0.0           | 990    | 4172          | 0.0           |
| 475    | 5328          | 4.1           | 605    | 128057        | 0.4           | 735    | 11255         | 0.0           | 865    | 3600          | 0.0           | 995    | 3177          | 0.0           |
| 480    | 5081          | 4.1           | 610    | 126031        | 0.2           | 740    | 9951          | 0.0           | 870    | 3609          | 0.0           | 1000   | 3241          | 0.0           |
| 485    | 5579          | 4.6           | 615    | 123059        | 0.1           | 745    | 8870          | 0.0           | 875    | 3208          | 0.0           |        |               |               |

REPORT NUMBER: SP1-1908-441-1-R4

Melanopic Flux vs. Wavelength



Melanopic Lumens: 2145.7 M/P: 0.35

| $\lambda$ (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            | 2044                              | 0.0                         | 490            | 7179                              | 11.1                        | 620            | 118034                            | 1.5                         | 750            | 8362                              | 0.0                         | 880            | 3128                              | 0.0                         |
| 365            | 2016                              | 0.0                         | 495            | 10476                             | 16.9                        | 625            | 111884                            | 0.9                         | 755            | 7635                              | 0.0                         | 885            | 3110                              | 0.0                         |
| 370            | 2020                              | 0.0                         | 500            | 15549                             | 26.0                        | 630            | 106119                            | 0.6                         | 760            | 6582                              | 0.0                         | 890            | 2632                              | 0.0                         |
| 375            | 2137                              | 0.0                         | 505            | 22477                             | 38.2                        | 635            | 99706                             | 0.4                         | 765            | 5777                              | 0.0                         | 895            | 2709                              | 0.0                         |
| 380            | 2046                              | 0.0                         | 510            | 30417                             | 51.6                        | 640            | 92142                             | 0.2                         | 770            | 5474                              | 0.0                         | 900            | 2016                              | 0.0                         |
| 385            | 1925                              | 0.0                         | 515            | 39274                             | 65.1                        | 645            | 84987                             | 0.1                         | 775            | 4977                              | 0.0                         | 905            | 1748                              | 0.0                         |
| 390            | 1893                              | 0.0                         | 520            | 47282                             | 75.2                        | 650            | 78016                             | 0.1                         | 780            | 4723                              | 0.0                         | 910            | 2046                              | 0.0                         |
| 395            | 1695                              | 0.0                         | 525            | 55413                             | 82.9                        | 655            | 71541                             | 0.1                         | 785            | 4219                              | 0.0                         | 915            | 1844                              | 0.0                         |
| 400            | 1633                              | 0.0                         | 530            | 62377                             | 86.0                        | 660            | 64863                             | 0.0                         | 790            | 3969                              | 0.0                         | 920            | 2734                              | 0.0                         |
| 405            | 2065                              | 0.1                         | 535            | 68520                             | 85.4                        | 665            | 58485                             | 0.0                         | 795            | 4122                              | 0.0                         | 925            | 2307                              | 0.0                         |
| 410            | 3449                              | 0.2                         | 540            | 73435                             | 81.1                        | 670            | 51641                             | 0.0                         | 800            | 2864                              | 0.0                         | 930            | 2039                              | 0.0                         |
| 415            | 7117                              | 0.7                         | 545            | 78677                             | 75.4                        | 675            | 46030                             | 0.0                         | 805            | 3151                              | 0.0                         | 935            | 1784                              | 0.0                         |
| 420            | 13992                             | 2.3                         | 550            | 83331                             | 68.1                        | 680            | 40590                             | 0.0                         | 810            | 3022                              | 0.0                         | 940            | 2464                              | 0.0                         |
| 425            | 25176                             | 6.2                         | 555            | 89120                             | 60.9                        | 685            | 35691                             | 0.0                         | 815            | 3471                              | 0.0                         | 945            | 2794                              | 0.0                         |
| 430            | 38151                             | 13.0                        | 560            | 94613                             | 52.9                        | 690            | 31631                             | 0.0                         | 820            | 2749                              | 0.0                         | 950            | 3090                              | 0.0                         |
| 435            | 49673                             | 22.2                        | 565            | 99818                             | 44.8                        | 695            | 27437                             | 0.0                         | 825            | 2729                              | 0.0                         | 955            | 1866                              | 0.0                         |
| 440            | 57273                             | 32.0                        | 570            | 106526                            | 37.6                        | 700            | 24589                             | 0.0                         | 830            | 2282                              | 0.0                         | 960            | 3110                              | 0.0                         |
| 445            | 54802                             | 36.7                        | 575            | 111610                            | 30.4                        | 705            | 21832                             | 0.0                         | 835            | 3140                              | 0.0                         | 965            | 3880                              | 0.0                         |
| 450            | 39184                             | 30.4                        | 580            | 117163                            | 24.1                        | 710            | 19500                             | 0.0                         | 840            | 2365                              | 0.0                         | 970            | 3243                              | 0.0                         |
| 455            | 22506                             | 19.7                        | 585            | 122201                            | 18.7                        | 715            | 17870                             | 0.0                         | 845            | 3024                              | 0.0                         | 975            | 2014                              | 0.0                         |
| 460            | 13692                             | 13.2                        | 590            | 125662                            | 14.0                        | 720            | 15924                             | 0.0                         | 850            | 2510                              | 0.0                         | 980            | 1688                              | 0.0                         |
| 465            | 9446                              | 10.0                        | 595            | 127415                            | 10.2                        | 725            | 14268                             | 0.0                         | 855            | 2739                              | 0.0                         | 985            | 2827                              | 0.0                         |
| 470            | 6698                              | 7.7                         | 600            | 129155                            | 7.3                         | 730            | 12438                             | 0.0                         | 860            | 3515                              | 0.0                         | 990            | 4172                              | 0.0                         |
| 475            | 5328                              | 6.7                         | 605            | 128057                            | 5.0                         | 735            | 11255                             | 0.0                         | 865            | 3600                              | 0.0                         | 995            | 3177                              | 0.0                         |
| 480            | 5081                              | 6.9                         | 610            | 126031                            | 3.4                         | 740            | 9951                              | 0.0                         | 870            | 3609                              | 0.0                         | 1000           | 3241                              | 0.0                         |
| 485            | 5579                              | 8.1                         | 615            | 123059                            | 2.3                         | 745            | 8870                              | 0.0                         | 875            | 3208                              | 0.0                         |                |                                   |                             |

REPORT NUMBER: SP1-1908-441-1-R4

TM-30-18

**Summary**

$R_f = 69.9$   
 $R_g = 98.3$   
 $CIE R_a = 71.5$   
 $R_9 = -16.1$



**Color Vector Graphics**





REPORT NUMBER: SP1-1908-441-1-R4

TM-30-18

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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 54 | CES51 = 77 | CES76 = 48 |
| CES02 = 63 | CES27 = 74 | CES52 = 80 | CES77 = 75 |
| CES03 = 31 | CES28 = 80 | CES53 = 66 | CES78 = 56 |
| CES04 = 71 | CES29 = 44 | CES54 = 77 | CES79 = 81 |
| CES05 = 50 | CES30 = 46 | CES55 = 74 | CES80 = 80 |
| CES06 = 52 | CES31 = 50 | CES56 = 63 | CES81 = 73 |
| CES07 = 42 | CES32 = 49 | CES57 = 60 | CES82 = 91 |
| CES08 = 41 | CES33 = 53 | CES58 = 63 | CES83 = 84 |
| CES09 = 29 | CES34 = 66 | CES59 = 85 | CES84 = 90 |
| CES10 = 77 | CES35 = 82 | CES60 = 89 | CES85 = 87 |
| CES11 = 60 | CES36 = 78 | CES61 = 85 | CES86 = 65 |
| CES12 = 66 | CES37 = 75 | CES62 = 69 | CES87 = 78 |
| CES13 = 43 | CES38 = 53 | CES63 = 68 | CES88 = 73 |
| CES14 = 74 | CES39 = 91 | CES64 = 68 | CES89 = 68 |
| CES15 = 71 | CES40 = 85 | CES65 = 65 | CES90 = 68 |
| CES16 = 48 | CES41 = 76 | CES66 = 62 | CES91 = 91 |
| CES17 = 50 | CES42 = 76 | CES67 = 60 | CES92 = 71 |
| CES18 = 57 | CES43 = 65 | CES68 = 68 | CES93 = 82 |
| CES19 = 73 | CES44 = 98 | CES69 = 77 | CES94 = 57 |
| CES20 = 67 | CES45 = 75 | CES70 = 60 | CES95 = 78 |
| CES21 = 88 | CES46 = 70 | CES71 = 57 | CES96 = 80 |
| CES22 = 80 | CES47 = 63 | CES72 = 86 | CES97 = 79 |
| CES23 = 92 | CES48 = 51 | CES73 = 52 | CES98 = 71 |
| CES24 = 91 | CES49 = 68 | CES74 = 90 | CES99 = 64 |
| CES25 = 73 | CES50 = 77 | CES75 = 58 |            |



REPORT NUMBER: SP1-1908-441-1-R4

TM-30-18

Color Rendition by Hue-Angle Bin



REPORT NUMBER: SP1-1908-441-1-R4

TM-30-18

Measure Comparisons



(END OF REPORT)