

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: P643581

Luminaire Tested: GWS-SA6F-730-U-RW-W-GRSBK

Issue Date: 1/10/2023

**Test Information**

Test Method: LM-79-2019  
Report Number: P643581  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2209-782-50)  
Test Lab: COOPER LIGHTING SOLUTIONS  
Issue Date: 1/10/2023  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: McGRAW-EDISON  
Catalog Number: GWS-SA6F-730-U-RW-W-GRSBK  
Description: GALLEON WALL SLIM LUMINAIRE. (6) LIGHTSQUARES WITH 16 LEDS EACH AND RECTANGULAR WIDE OPTICS W/ FACTORY INSTALLED GLARE SHIELD, BK  
Light Source: (96) 3000K CCT, 70 CRI LEDS  
Ballast/Driver: -

**Summary**

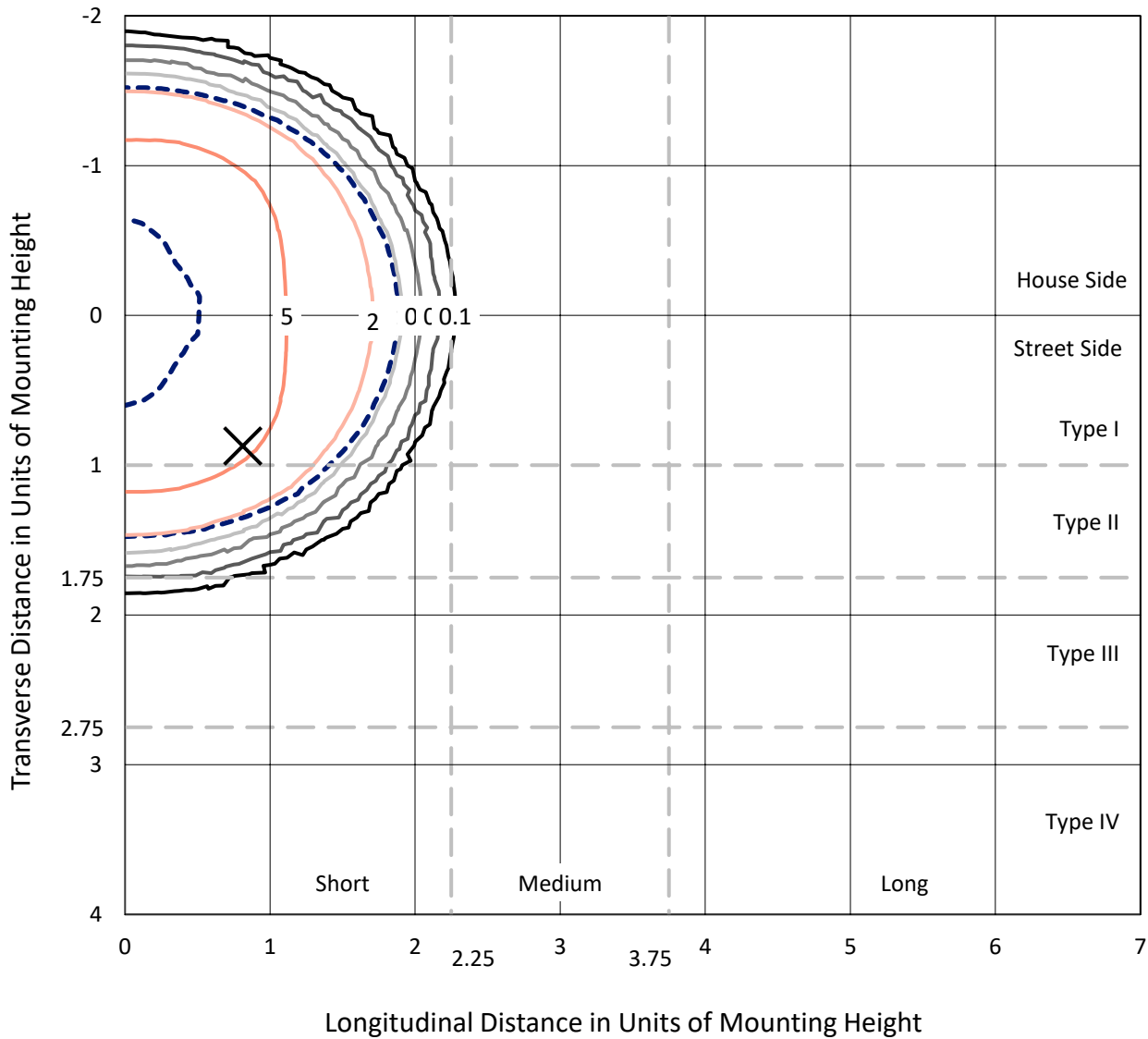
Lumens per Lamp: N/A  
Luminaire Lumens: 29373.9 lumens  
Efficiency: N/A  
Efficacy: 78.8 lumens/watt  
Luminous Opening: Rectangular (W 2' x L: 1' x H: 0')  
IES Classification: Type V - Short  
BUG Rating: B5 - U0 - G1  
  
Input Watts (W): 372.6  
Input Voltage (V): 120  
Input Current (Ain): NR  
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: P643581  
 CATALOG NUMBER: GWS-SA6F-730-U-RW-W-GRSBK

### Iso-Footcandle Lines of Horizontal Illumination

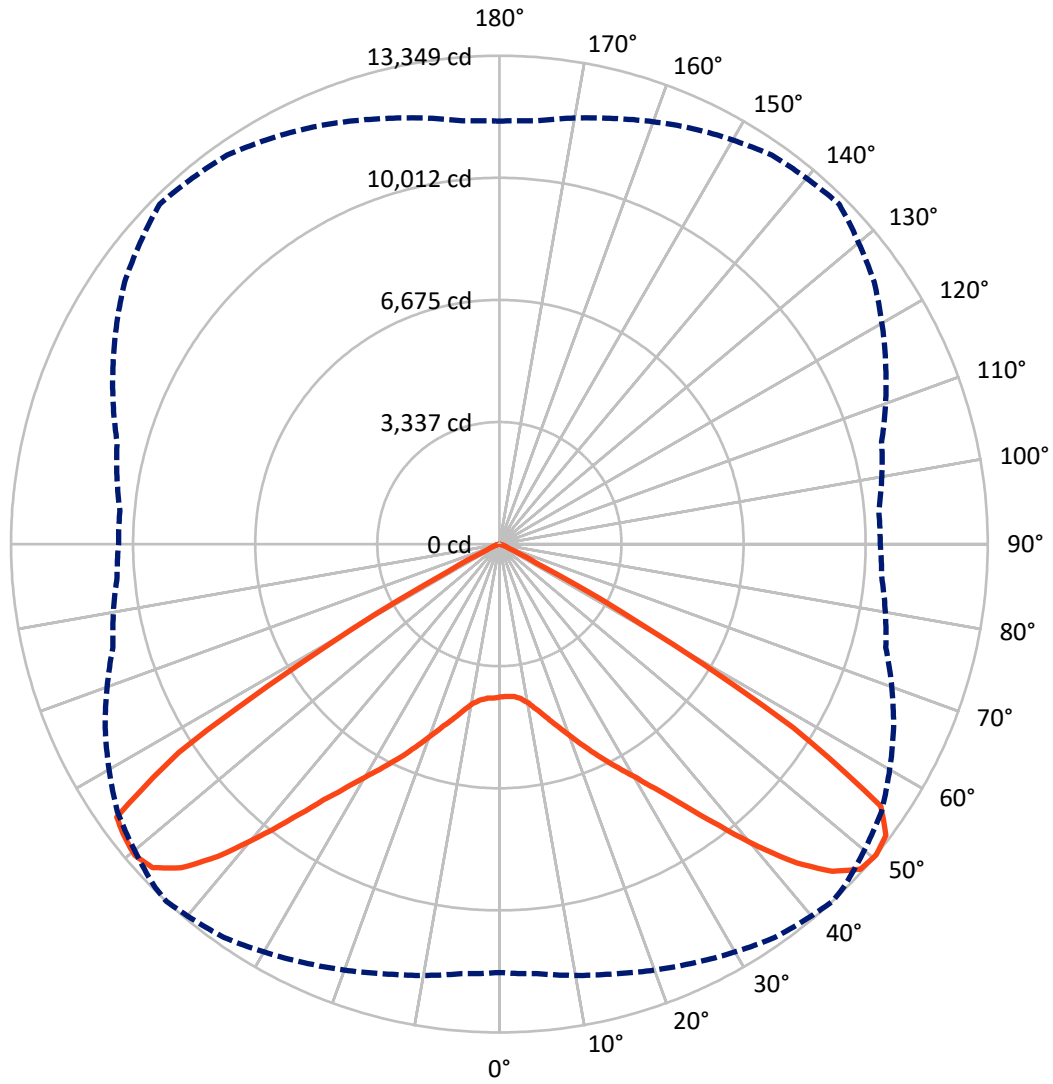
✕ Max cd  
 - - - 1/2 Max cd



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

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### Luminous Intensity Polar Plot



— Vertical Plane Through 43-Deg Lateral    - - - Horizontal Cone Through 50-Deg Vertical

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**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 14686.6  | 0.0    | 14686.6 |
|                    | % Fixture | 50.0     | 0.0    | 50.0    |
| <b>Street Side</b> | Lumens    | 14687.3  | 0.0    | 14687.3 |
|                    | % Fixture | 50.0     | 0.0    | 50.0    |
| <b>Total</b>       | Lumens    | 29373.9  | 0.0    | 29373.9 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 411.4   | 1.4       |
| 10°-20°   | 1415.9  | 4.8       |
| 20°-30°   | 2864.5  | 9.8       |
| 30°-40°   | 5314.7  | 18.1      |
| 40°-50°   | 8822.1  | 30.0      |
| 50°-60°   | 9003.3  | 30.7      |
| 60°-70°   | 1476.4  | 5.0       |
| 70°-80°   | 64.6    | 0.2       |
| 80°-90°   | 0.9     | 0.0       |
| 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°    | 29373.9 | 100.0     |
| 0°-180°   | 29373.9 | 100.0     |

**Coefficient of Utilization**



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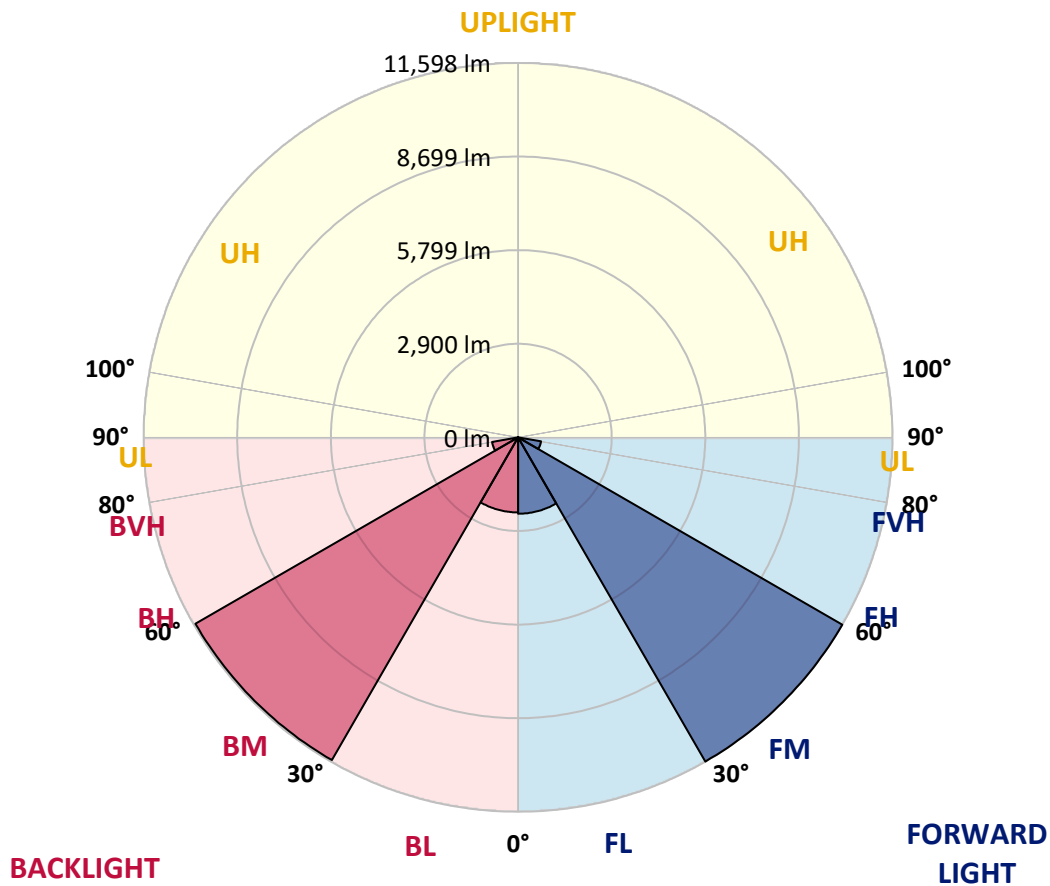
CATALOG NUMBER: GWS-SA6F-730-U-RW-W-GRSBK

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

| Zone           | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |         |
|----------------|---------|-----------|-------------------------|------|---------|
|                |         |           | B                       | U    | G       |
| FL (0°-30°)    | 2366.5  | 8.1       |                         |      |         |
| FM (30°-60°)   | 11598.2 | 39.5      |                         |      |         |
| FH (60°-80°)   | 722.3   | 2.5       |                         |      | G1/1800 |
| FVH (80°-90°)  | 0.3     | 0.0       |                         |      | G0/10   |
| BL (0°-30°)    | 2325.3  | 7.9       | B3/2500                 |      |         |
| BM (30°-60°)   | 11541.9 | 39.3      | B5                      |      |         |
| BH (60°-80°)   | 818.8   | 2.8       | B2/1000                 |      | G1/1800 |
| BVH (80°-90°)  | 0.6     | 0.0       |                         |      | G0/10   |
| UL (90°-100°)  | 0.0     | 0.0       |                         | U0/0 |         |
| UH (100°-180°) | 0.0     | 0.0       |                         | U0/0 |         |

**BUG Rating: B5-U0-G1**

Type V Short





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 43°     | 45°     | 55°     | 65°     | 75°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 4178.0  | 4178.0  | 4178.0  | 4178.0  | 4178.0  | 4178.0  | 4178.0  | 4178.0  | 4178.0  | 4178.0  | 4178.0  |
| 2.5°  | 4100.0  | 4109.7  | 4122.7  | 4135.7  | 4152.0  | 4168.2  | 4178.0  | 4207.2  | 4200.7  | 4226.7  | 4226.7  |
| 5°    | 4054.5  | 4064.3  | 4080.5  | 4109.7  | 4145.5  | 4181.2  | 4207.2  | 4265.7  | 4298.2  | 4350.2  | 4369.7  |
| 7.5°  | 4077.3  | 4090.3  | 4109.7  | 4155.2  | 4210.5  | 4265.7  | 4294.9  | 4389.1  | 4454.1  | 4551.6  | 4606.8  |
| 10°   | 4152.0  | 4165.0  | 4197.5  | 4275.4  | 4346.9  | 4424.9  | 4460.6  | 4580.8  | 4684.8  | 4818.0  | 4896.0  |
| 12.5° | 4236.5  | 4252.7  | 4317.7  | 4434.6  | 4558.1  | 4662.0  | 4710.8  | 4844.0  | 4951.2  | 5100.6  | 5224.1  |
| 15°   | 4324.2  | 4350.2  | 4450.9  | 4623.1  | 4798.5  | 4938.2  | 4990.2  | 5133.1  | 5240.3  | 5399.5  | 5539.2  |
| 17.5° | 4528.8  | 4558.1  | 4671.8  | 4857.0  | 5097.4  | 5259.8  | 5305.3  | 5454.8  | 5536.0  | 5643.2  | 5789.4  |
| 20°   | 4785.5  | 4840.7  | 4980.4  | 5204.6  | 5467.8  | 5623.7  | 5656.2  | 5802.4  | 5795.9  | 5841.4  | 5968.1  |
| 22.5° | 5103.9  | 5142.9  | 5295.6  | 5562.0  | 5857.6  | 6029.8  | 6104.5  | 6166.2  | 6085.0  | 6046.0  | 6127.3  |
| 25°   | 5435.3  | 5480.7  | 5646.4  | 5938.8  | 6270.2  | 6468.4  | 6530.1  | 6578.8  | 6448.9  | 6302.7  | 6312.4  |
| 27.5° | 5864.1  | 5896.6  | 6059.0  | 6370.9  | 6702.3  | 6926.5  | 6981.7  | 7066.2  | 6894.0  | 6660.1  | 6595.1  |
| 30°   | 6374.2  | 6406.7  | 6578.8  | 6907.0  | 7235.1  | 7426.8  | 7511.3  | 7615.2  | 7426.8  | 7134.4  | 7059.7  |
| 32.5° | 6972.0  | 7004.4  | 7225.4  | 7563.2  | 7832.9  | 8040.8  | 8122.0  | 8232.5  | 8083.0  | 7754.9  | 7670.4  |
| 35°   | 7686.7  | 7706.2  | 7966.1  | 8333.2  | 8619.1  | 8820.5  | 8875.8  | 9005.7  | 8840.0  | 8511.9  | 8466.4  |
| 37.5° | 8515.1  | 8537.9  | 8820.5  | 9246.1  | 9538.5  | 9762.7  | 9850.4  | 9886.1  | 9684.7  | 9317.6  | 9281.9  |
| 40°   | 9424.8  | 9499.5  | 9775.7  | 10233.8 | 10561.9 | 10844.5 | 10922.5 | 10802.3 | 10519.7 | 10019.3 | 9954.4  |
| 42.5° | 10373.5 | 10438.4 | 10747.1 | 11244.1 | 11624.3 | 11913.4 | 11916.6 | 11656.7 | 11175.9 | 10483.9 | 10386.5 |
| 45°   | 11162.9 | 11188.9 | 11588.5 | 12088.8 | 12556.7 | 12761.3 | 12780.8 | 12309.8 | 11585.3 | 10753.6 | 10545.6 |
| 47.5° | 11705.5 | 11747.7 | 12095.3 | 12576.2 | 13092.7 | 13277.9 | 13238.9 | 12650.9 | 11780.2 | 10929.0 | 10584.6 |
| 50°   | 11712.0 | 11783.4 | 12160.3 | 12624.9 | 13125.2 | 13349.4 | 13294.1 | 12748.3 | 11890.7 | 10935.5 | 10490.4 |
| 52.5° | 10675.6 | 10792.6 | 11406.6 | 12079.1 | 12845.8 | 13229.2 | 13242.2 | 12875.0 | 11848.4 | 10831.5 | 10405.9 |
| 55°   | 8053.8  | 8180.5  | 8953.7  | 10100.6 | 11582.0 | 12650.9 | 12836.1 | 12725.6 | 11799.7 | 10877.0 | 10555.4 |
| 57.5° | 4262.4  | 4165.0  | 4593.8  | 5730.9  | 7592.5  | 9483.3  | 10025.8 | 10909.5 | 11257.1 | 10932.3 | 10831.5 |
| 60°   | 929.2   | 990.9   | 1319.0  | 1777.1  | 2962.9  | 4460.6  | 4990.2  | 6504.1  | 8304.0  | 9103.2  | 9681.5  |
| 62.5° | 399.6   | 393.1   | 409.4   | 464.6   | 679.0   | 1130.6  | 1380.7  | 2254.7  | 3557.4  | 4886.2  | 5786.1  |
| 65°   | 328.1   | 331.4   | 344.4   | 344.4   | 321.6   | 324.9   | 341.1   | 516.6   | 831.7   | 1166.3  | 1565.9  |
| 67.5° | 246.9   | 250.2   | 272.9   | 279.4   | 263.2   | 233.9   | 230.7   | 194.9   | 204.7   | 256.7   | 266.4   |
| 70°   | 155.9   | 155.9   | 168.9   | 175.4   | 175.4   | 162.4   | 159.2   | 139.7   | 136.5   | 155.9   | 175.4   |
| 72.5° | 84.5    | 84.5    | 91.0    | 94.2    | 91.0    | 87.7    | 87.7    | 84.5    | 81.2    | 94.2    | 120.2   |
| 75°   | 35.7    | 35.7    | 39.0    | 39.0    | 35.7    | 35.7    | 35.7    | 35.7    | 35.7    | 42.2    | 65.0    |
| 77.5° | 6.5     | 9.7     | 13.0    | 9.7     | 6.5     | 6.5     | 6.5     | 9.7     | 9.7     | 13.0    | 19.5    |
| 80°   | 3.2     | 3.2     | 6.5     | 3.2     | 0.0     | 0.0     | 0.0     | 0.0     | 3.2     | 3.2     | 3.2     |
| 82.5° | 3.2     | 3.2     | 3.2     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 3.2     |
| 85°   | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| 87.5° | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| 90°   | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |



REPORT NUMBER: P643581

CATALOG NUMBER: GWS-SA6F-730-U-RW-W-GRSBK

**CANDELA DISTRIBUTION (continued):**

|       | 90°     | 95°     | 105°    | 115°    | 125°    | 135°    | 145°    | 155°    | 165°    | 175°    | 180°    |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 4178.0  | 4178.0  | 4178.0  | 4178.0  | 4178.0  | 4178.0  | 4178.0  | 4178.0  | 4178.0  | 4178.0  | 4178.0  |
| 2.5°  | 4249.4  | 4213.7  | 4226.7  | 4233.2  | 4223.5  | 4217.0  | 4181.2  | 4171.5  | 4155.2  | 4129.2  | 4122.7  |
| 5°    | 4392.4  | 4363.2  | 4359.9  | 4340.4  | 4294.9  | 4239.7  | 4171.5  | 4142.2  | 4109.7  | 4077.3  | 4070.8  |
| 7.5°  | 4632.8  | 4597.1  | 4574.3  | 4509.4  | 4405.4  | 4317.7  | 4204.0  | 4142.2  | 4100.0  | 4057.8  | 4048.0  |
| 10°   | 4941.4  | 4899.2  | 4834.2  | 4714.0  | 4574.3  | 4447.6  | 4314.4  | 4233.2  | 4168.2  | 4109.7  | 4106.5  |
| 12.5° | 5269.6  | 5224.1  | 5107.1  | 4954.4  | 4785.5  | 4668.5  | 4499.6  | 4385.9  | 4288.4  | 4200.7  | 4191.0  |
| 15°   | 5613.9  | 5558.7  | 5399.5  | 5217.6  | 5061.6  | 4941.4  | 4756.3  | 4574.3  | 4424.9  | 4298.2  | 4285.2  |
| 17.5° | 5877.1  | 5808.9  | 5620.4  | 5484.0  | 5357.3  | 5233.8  | 5025.9  | 4785.5  | 4587.3  | 4434.6  | 4398.9  |
| 20°   | 6042.8  | 5977.8  | 5799.1  | 5724.4  | 5665.9  | 5578.2  | 5331.3  | 5081.1  | 4860.2  | 4671.8  | 4639.3  |
| 22.5° | 6202.0  | 6124.0  | 5968.1  | 5968.1  | 6013.6  | 5977.8  | 5711.4  | 5425.5  | 5165.6  | 4947.9  | 4899.2  |
| 25°   | 6380.7  | 6318.9  | 6208.5  | 6299.4  | 6413.2  | 6409.9  | 6137.0  | 5779.6  | 5480.7  | 5237.1  | 5188.4  |
| 27.5° | 6640.6  | 6578.8  | 6539.9  | 6712.0  | 6855.0  | 6845.2  | 6546.4  | 6159.7  | 5844.6  | 5604.2  | 5558.7  |
| 30°   | 7098.7  | 7040.2  | 6997.9  | 7205.9  | 7387.8  | 7319.6  | 6991.4  | 6617.8  | 6299.4  | 6026.5  | 5994.1  |
| 32.5° | 7709.4  | 7647.7  | 7592.5  | 7800.4  | 7962.8  | 7875.1  | 7563.2  | 7212.4  | 6845.2  | 6578.8  | 6513.9  |
| 35°   | 8511.9  | 8381.9  | 8326.7  | 8573.6  | 8641.8  | 8544.4  | 8245.5  | 7936.8  | 7547.0  | 7241.6  | 7199.4  |
| 37.5° | 9340.3  | 9187.6  | 9148.7  | 9363.1  | 9473.5  | 9437.8  | 9086.9  | 8765.3  | 8343.0  | 8005.1  | 7956.3  |
| 40°   | 10048.6 | 9908.9  | 9840.7  | 10175.3 | 10425.4 | 10448.2 | 10133.0 | 9739.9  | 9242.9  | 8892.0  | 8804.3  |
| 42.5° | 10464.4 | 10344.2 | 10328.0 | 10847.8 | 11257.1 | 11549.5 | 11172.7 | 10766.6 | 10243.5 | 9847.2  | 9775.7  |
| 45°   | 10558.6 | 10480.7 | 10617.1 | 11299.4 | 11936.1 | 12468.9 | 12147.3 | 11718.5 | 11153.2 | 10734.1 | 10665.9 |
| 47.5° | 10548.9 | 10522.9 | 10766.6 | 11533.3 | 12339.0 | 12995.2 | 12836.1 | 12352.0 | 11806.2 | 11367.6 | 11302.6 |
| 50°   | 10409.2 | 10412.4 | 10818.5 | 11650.2 | 12501.4 | 13138.2 | 12979.0 | 12530.7 | 12043.3 | 11611.3 | 11559.3 |
| 52.5° | 10354.0 | 10334.5 | 10721.1 | 11614.5 | 12667.1 | 13073.2 | 12715.9 | 12212.3 | 11669.7 | 11136.9 | 11059.0 |
| 55°   | 10548.9 | 10500.2 | 10734.1 | 11585.3 | 12686.6 | 13037.5 | 12095.3 | 11003.7 | 9892.6  | 9262.4  | 9210.4  |
| 57.5° | 10841.3 | 10789.3 | 10899.8 | 11370.8 | 11669.7 | 10841.3 | 8901.7  | 7140.9  | 5997.3  | 5513.2  | 5302.1  |
| 60°   | 9681.5  | 9645.7  | 9561.3  | 8992.7  | 7712.7  | 5818.6  | 3963.6  | 2527.6  | 1816.1  | 1468.5  | 1468.5  |
| 62.5° | 6007.1  | 5958.3  | 5500.2  | 4087.0  | 2969.4  | 1718.6  | 945.4   | 591.3   | 448.3   | 419.1   | 415.8   |
| 65°   | 1686.1  | 1676.4  | 1387.2  | 981.1   | 623.8   | 386.6   | 341.1   | 347.6   | 341.1   | 331.4   | 328.1   |
| 67.5° | 253.4   | 279.4   | 279.4   | 227.4   | 217.7   | 243.7   | 285.9   | 305.4   | 289.1   | 272.9   | 266.4   |
| 70°   | 162.4   | 175.4   | 168.9   | 146.2   | 155.9   | 181.9   | 204.7   | 207.9   | 198.2   | 181.9   | 178.7   |
| 72.5° | 113.7   | 126.7   | 104.0   | 94.2    | 97.5    | 107.2   | 117.0   | 117.0   | 113.7   | 107.2   | 100.7   |
| 75°   | 68.2    | 68.2    | 48.7    | 45.5    | 45.5    | 48.7    | 48.7    | 55.2    | 55.2    | 52.0    | 48.7    |
| 77.5° | 22.7    | 26.0    | 16.2    | 13.0    | 13.0    | 13.0    | 16.2    | 19.5    | 19.5    | 16.2    | 13.0    |
| 80°   | 3.2     | 6.5     | 3.2     | 3.2     | 3.2     | 3.2     | 3.2     | 3.2     | 6.5     | 6.5     | 3.2     |
| 82.5° | 3.2     | 3.2     | 3.2     | 0.0     | 0.0     | 0.0     | 0.0     | 3.2     | 3.2     | 3.2     | 3.2     |
| 85°   | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 3.2     | 3.2     |
| 87.5° | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| 90°   | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |



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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: SP1-1908-441-2-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 .

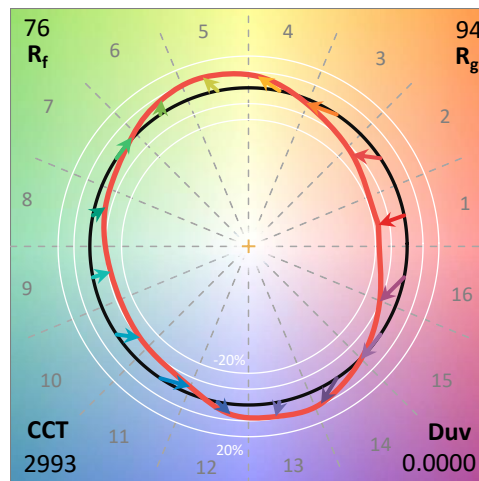
**Test Information**

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**



#####

| $\lambda$<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

Scotopic Flux vs. Wavelength



Scotopic Lumens: 8494.8

S/P: 1.23

| 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

**Melanopic Flux vs. Wavelength**



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

| 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

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)