

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: P643223

Luminaire Tested: GWS-SA6E-740-U-T2R-W-GRSWH

Issue Date: 1/10/2023

**Test Information**

Test Method: LM-79-2019  
Report Number: P643223  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2209-782-13)  
Test Lab: COOPER LIGHTING SOLUTIONS  
Issue Date: 1/10/2023  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: McGRAW-EDISON  
Catalog Number: GWS-SAGE-740-U-T2R-W-GRSWH  
Description: GALLEON WALL SLIM LUMINAIRE. (6) LIGHTSQUARES WITH 16 LEDS EACH AND TYPE II ROADWAY OPTICS W/ FACTORY INSTALLED GLARE SHIELD, WH  
Light Source: (96) 4000K CCT, 70 CRI LEDS  
Ballast/Driver: -

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 39397.4 lumens  
Efficiency: N/A  
Efficacy: 121.7 lumens/watt  
Luminous Opening: Rectangular (W 2' x L: 1' x H: 0')  
IES Classification: Type II - Short  
BUG Rating: B4 - U0 - G3  
  
Input Watts (W): 323.8  
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

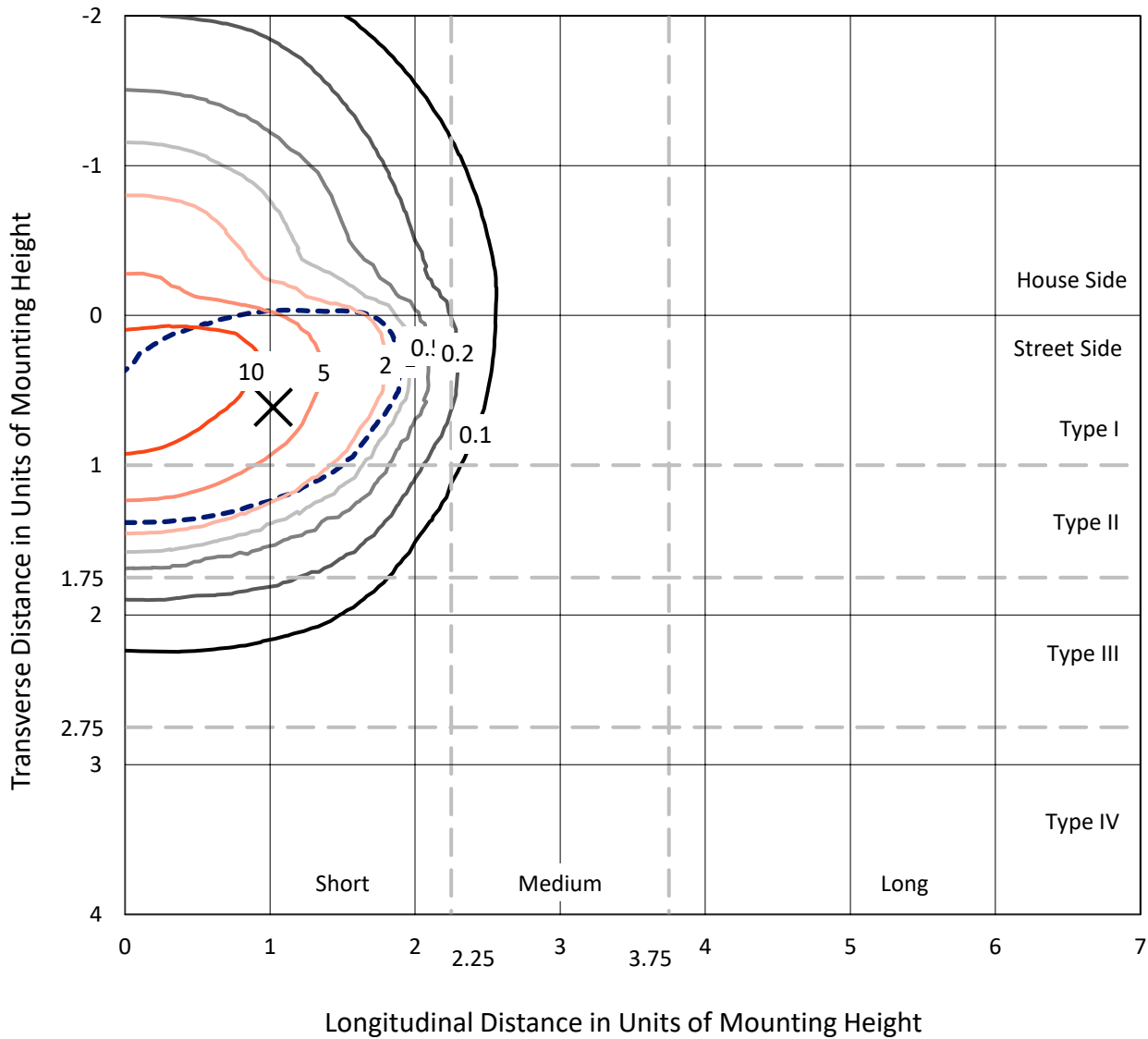


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### Iso-Footcandle Lines of Horizontal Illumination

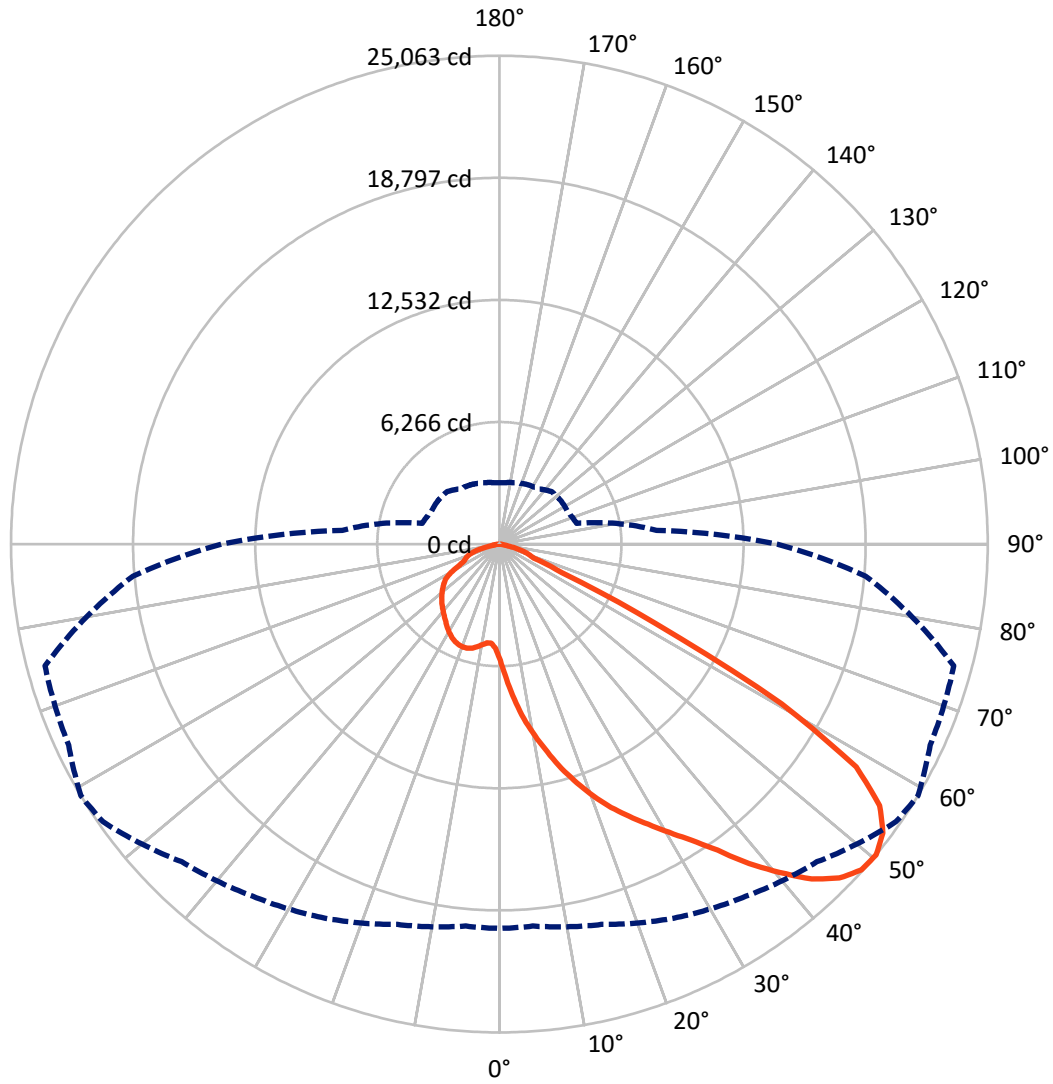
✕ Max cd  
 - - - 1/2 Max cd



Based on 30 foot mounting height. Maximum calculated value = 13.1 fc  
 Type II - Short - N/A

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CATALOG NUMBER: GWS-SA6E-740-U-T2R-W-GRSWH

### Luminous Intensity Polar Plot



— Vertical Plane Through 59-Deg Lateral    - - - Horizontal Cone Through 50-Deg Vertical

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**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 9062.1   | 0.0    | 9062.1  |
|                    | % Fixture | 23.0     | 0.0    | 23.0    |
| <b>Street Side</b> | Lumens    | 30335.2  | 0.0    | 30335.2 |
|                    | % Fixture | 77.0     | 0.0    | 77.0    |
| <b>Total</b>       | Lumens    | 39397.4  | 0.0    | 39397.4 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 669.6   | 1.7       |
| 10°-20°   | 2430.8  | 6.2       |
| 20°-30°   | 4603.0  | 11.7      |
| 30°-40°   | 7633.2  | 19.4      |
| 40°-50°   | 10427.4 | 26.5      |
| 50°-60°   | 9465.4  | 24.0      |
| 60°-70°   | 3152.1  | 8.0       |
| 70°-80°   | 919.3   | 2.3       |
| 80°-90°   | 96.6    | 0.2       |
| 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°    | 39397.4 | 100.0     |
| 0°-180°   | 39397.4 | 100.0     |

**Coefficient of Utilization**



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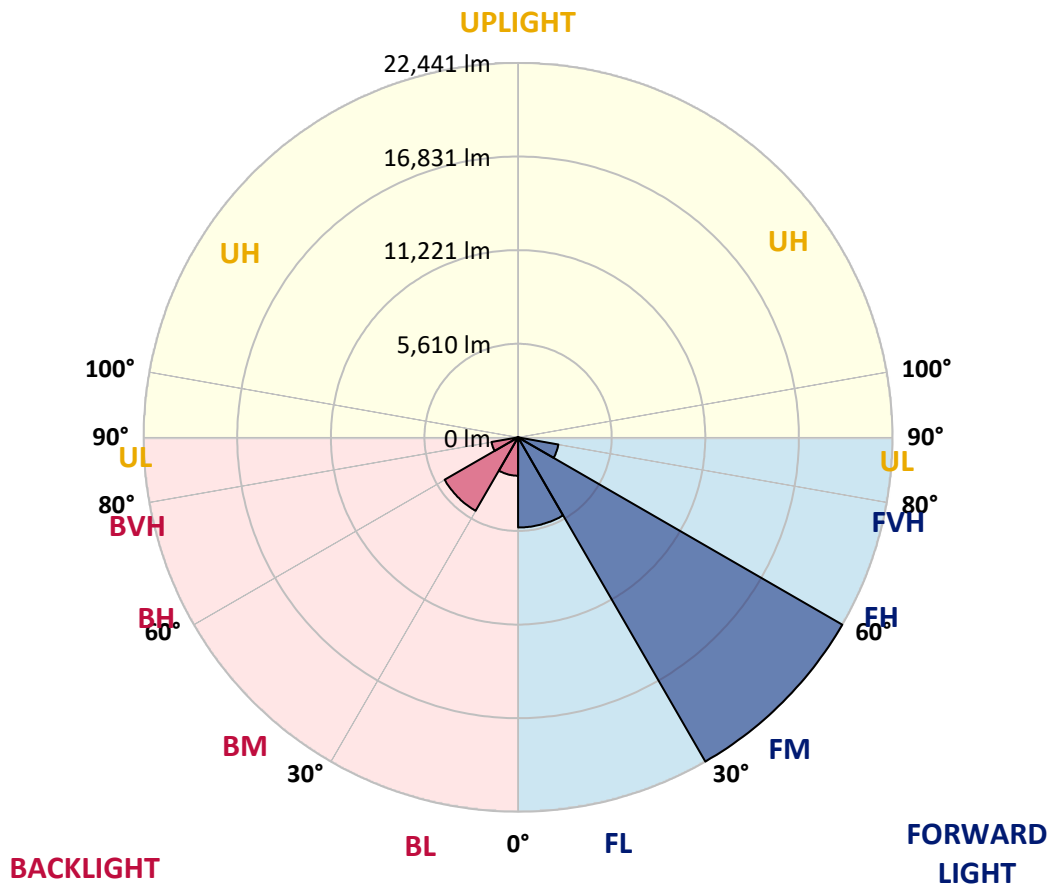
CATALOG NUMBER: GWS-SA6E-740-U-T2R-W-GRSWH

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

| Zone           | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |         |
|----------------|---------|-----------|-------------------------|------|---------|
|                |         |           | B                       | U    | G       |
| FL (0°-30°)    | 5402.3  | 13.7      |                         |      |         |
| FM (30°-60°)   | 22441.2 | 57.0      |                         |      |         |
| FH (60°-80°)   | 2453.9  | 6.2       |                         |      | G2/5000 |
| FVH (80°-90°)  | 37.8    | 0.1       |                         |      | G1/100  |
| BL (0°-30°)    | 2301.1  | 5.8       | B3/2500                 |      |         |
| BM (30°-60°)   | 5084.7  | 12.9      | B4/8500                 |      |         |
| BH (60°-80°)   | 1617.5  | 4.1       | B3/2500                 |      | G3/2500 |
| BVH (80°-90°)  | 58.8    | 0.1       |                         |      | G1/100  |
| UL (90°-100°)  | 0.0     | 0.0       |                         | U0/0 |         |
| UH (100°-180°) | 0.0     | 0.0       |                         | U0/0 |         |

**BUG Rating: B4-U0-G3**

Type II Short





REPORT NUMBER: P643223

CATALOG NUMBER: GWS-SA6E-740-U-T2R-W-GRSWH

**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 45°     | 55°     | 59°     | 65°     | 75°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 5969.0  | 5969.0  | 5969.0  | 5969.0  | 5969.0  | 5969.0  | 5969.0  | 5969.0  | 5969.0  | 5969.0  | 5969.0  |
| 2.5°  | 7734.0  | 7791.8  | 7701.9  | 7708.3  | 7483.7  | 7381.0  | 7092.2  | 6922.1  | 6809.8  | 6495.3  | 6209.7  |
| 5°    | 9293.6  | 9226.3  | 9155.7  | 9113.9  | 8918.2  | 8642.2  | 8282.8  | 7997.2  | 7734.0  | 7117.9  | 6524.2  |
| 7.5°  | 10250.0 | 10214.7 | 10166.5 | 10140.9 | 9948.3  | 9659.5  | 9300.1  | 9056.2  | 8674.3  | 7839.9  | 6906.1  |
| 10°   | 11061.9 | 11020.2 | 10991.3 | 11010.5 | 10853.3 | 10667.2 | 10275.6 | 9996.4  | 9566.4  | 8603.7  | 7368.2  |
| 12.5° | 11690.9 | 11713.3 | 11723.0 | 11825.6 | 11758.3 | 11645.9 | 11241.6 | 10946.3 | 10468.2 | 9409.2  | 7910.5  |
| 15°   | 12188.3 | 12181.9 | 12294.2 | 12489.9 | 12599.1 | 12528.4 | 12204.3 | 11957.2 | 11373.2 | 10201.8 | 8494.6  |
| 17.5° | 12303.8 | 12310.2 | 12486.7 | 12830.1 | 13186.3 | 13359.6 | 13176.7 | 12881.5 | 12303.8 | 10984.9 | 9101.1  |
| 20°   | 12396.9 | 12409.7 | 12592.6 | 12984.1 | 13504.0 | 13988.6 | 14017.5 | 13805.7 | 13308.3 | 11832.1 | 9717.3  |
| 22.5° | 12984.1 | 13013.0 | 13061.2 | 13308.3 | 13776.8 | 14389.7 | 14726.7 | 14681.8 | 14264.6 | 12721.0 | 10381.5 |
| 25°   | 14527.7 | 14441.1 | 14206.8 | 14136.2 | 14315.9 | 14813.4 | 15387.8 | 15474.4 | 15269.0 | 13699.8 | 11097.2 |
| 27.5° | 16434.0 | 16340.9 | 15994.3 | 15628.5 | 15240.2 | 15413.5 | 16026.4 | 16286.3 | 16289.6 | 14778.1 | 11816.0 |
| 30°   | 18163.7 | 18089.9 | 17807.5 | 17284.4 | 16613.7 | 16363.4 | 16815.8 | 17165.6 | 17374.2 | 16023.2 | 12634.4 |
| 32.5° | 19643.1 | 19575.7 | 19193.8 | 18767.0 | 18112.3 | 17608.5 | 17772.2 | 18109.1 | 18596.9 | 17634.2 | 13651.6 |
| 35°   | 20888.2 | 20820.8 | 20455.0 | 20025.0 | 19418.5 | 19116.8 | 19059.0 | 19290.1 | 19922.3 | 19315.8 | 14819.8 |
| 37.5° | 21899.1 | 21831.7 | 21449.8 | 21045.5 | 20583.4 | 20602.6 | 20689.3 | 20801.6 | 21164.2 | 21116.1 | 16068.1 |
| 40°   | 22553.8 | 22483.2 | 22210.4 | 21921.6 | 21629.5 | 21860.6 | 22290.6 | 22155.8 | 22348.4 | 22569.8 | 17217.0 |
| 42.5° | 22845.8 | 22756.0 | 22598.7 | 22534.5 | 22444.7 | 22804.1 | 23632.0 | 23497.3 | 23266.2 | 23539.0 | 18070.6 |
| 45°   | 22553.8 | 22476.8 | 22473.5 | 22669.3 | 22877.9 | 23340.0 | 24559.5 | 24450.4 | 23866.3 | 24007.5 | 18580.9 |
| 47.5° | 21658.4 | 21591.0 | 21774.0 | 22287.4 | 22800.9 | 23474.8 | 24973.5 | 24992.7 | 24293.1 | 24203.3 | 18911.4 |
| 50°   | 19723.3 | 19678.4 | 20207.9 | 21180.3 | 22066.0 | 23054.4 | 24841.9 | 25063.3 | 24395.8 | 24142.3 | 18869.7 |
| 52.5° | 15788.9 | 15997.5 | 17149.6 | 18773.4 | 20493.5 | 22316.3 | 24354.1 | 24642.9 | 23901.6 | 23741.2 | 18645.1 |
| 55°   | 10808.4 | 10904.6 | 12056.7 | 14428.3 | 17156.0 | 20718.2 | 23234.1 | 23680.2 | 23317.5 | 23673.8 | 18879.3 |
| 57.5° | 5596.7  | 5673.7  | 6581.9  | 8687.1  | 11636.3 | 16373.0 | 20124.5 | 21587.8 | 22139.8 | 24013.9 | 19607.8 |
| 60°   | 2297.7  | 2361.9  | 2737.4  | 3754.7  | 5869.5  | 9534.3  | 14482.8 | 16652.2 | 17948.7 | 21931.2 | 17412.7 |
| 62.5° | 1668.7  | 1700.8  | 1880.6  | 2240.0  | 3074.3  | 4672.5  | 8196.1  | 8995.2  | 9906.6  | 13744.7 | 11055.5 |
| 65°   | 1405.6  | 1440.9  | 1585.3  | 1803.5  | 2243.2  | 2865.8  | 3501.2  | 3520.4  | 3879.8  | 5599.9  | 4098.1  |
| 67.5° | 1177.8  | 1209.8  | 1338.2  | 1524.3  | 1813.2  | 2034.6  | 1880.6  | 1883.8  | 1877.3  | 2031.4  | 1964.0  |
| 70°   | 917.8   | 943.5   | 1071.8  | 1270.8  | 1421.6  | 1306.1  | 1469.8  | 1627.0  | 1559.6  | 1620.6  | 1713.7  |
| 72.5° | 670.7   | 699.6   | 811.9   | 962.7   | 924.2   | 930.6   | 1190.6  | 1351.0  | 1312.5  | 1379.9  | 1466.6  |
| 75°   | 484.6   | 503.8   | 561.6   | 481.4   | 507.0   | 612.9   | 837.6   | 924.2   | 962.7   | 1020.5  | 1097.5  |
| 77.5° | 157.2   | 157.2   | 176.5   | 221.4   | 276.0   | 340.2   | 426.8   | 462.1   | 519.9   | 584.1   | 638.6   |
| 80°   | 80.2    | 83.4    | 99.5    | 121.9   | 154.0   | 195.8   | 250.3   | 266.4   | 295.2   | 330.5   | 353.0   |
| 82.5° | 38.5    | 41.7    | 48.1    | 61.0    | 80.2    | 102.7   | 138.0   | 154.0   | 173.3   | 195.8   | 211.8   |
| 85°   | 9.6     | 9.6     | 12.8    | 19.3    | 25.7    | 38.5    | 51.3    | 61.0    | 77.0    | 93.1    | 102.7   |
| 87.5° | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 3.2     | 9.6     | 12.8    | 16.0    | 19.3    | 25.7    |
| 90°   | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |



REPORT NUMBER: P643223

CATALOG NUMBER: GWS-SA6E-740-U-T2R-W-GRSWH

**CANDELA DISTRIBUTION (continued):**

|       | 90°     | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 5969.0  | 5969.0 | 5969.0 | 5969.0 | 5969.0 | 5969.0 | 5969.0 | 5969.0 | 5969.0 | 5969.0 | 5969.0 |
| 2.5°  | 6081.3  | 5901.6 | 5670.5 | 5474.8 | 5295.1 | 5157.1 | 5038.3 | 4980.6 | 4926.0 | 4887.5 | 4900.3 |
| 5°    | 6248.2  | 5940.1 | 5510.1 | 5211.6 | 5028.7 | 4935.6 | 4871.5 | 4839.4 | 4833.0 | 4807.3 | 4797.7 |
| 7.5°  | 6492.1  | 6052.4 | 5478.0 | 5176.3 | 5054.4 | 5006.2 | 4970.9 | 4951.7 | 4961.3 | 4935.6 | 4926.0 |
| 10°   | 6793.7  | 6238.6 | 5558.2 | 5291.9 | 5186.0 | 5150.7 | 5112.1 | 5086.5 | 5073.6 | 5035.1 | 5028.7 |
| 12.5° | 7169.2  | 6469.6 | 5702.6 | 5439.5 | 5333.6 | 5272.6 | 5221.3 | 5176.3 | 5147.4 | 5099.3 | 5086.5 |
| 15°   | 7573.6  | 6726.3 | 5872.7 | 5583.9 | 5458.7 | 5368.9 | 5285.4 | 5218.0 | 5166.7 | 5102.5 | 5092.9 |
| 17.5° | 8013.2  | 6995.9 | 6013.9 | 5683.4 | 5522.9 | 5404.2 | 5282.2 | 5182.7 | 5112.1 | 5028.7 | 5019.1 |
| 20°   | 8472.1  | 7268.7 | 6119.8 | 5731.5 | 5526.1 | 5365.7 | 5202.0 | 5070.4 | 4980.6 | 4897.1 | 4890.7 |
| 22.5° | 8947.1  | 7519.0 | 6184.0 | 5718.7 | 5474.8 | 5275.8 | 5080.1 | 4932.4 | 4826.5 | 4727.1 | 4720.6 |
| 25°   | 9425.2  | 7759.7 | 6200.0 | 5667.3 | 5372.1 | 5141.0 | 4945.3 | 4772.0 | 4653.2 | 4540.9 | 4528.1 |
| 27.5° | 9909.8  | 7961.9 | 6161.5 | 5564.6 | 5234.1 | 4983.8 | 4788.0 | 4617.9 | 4496.0 | 4383.7 | 4364.4 |
| 30°   | 10426.5 | 8135.1 | 6078.1 | 5429.9 | 5073.6 | 4816.9 | 4624.4 | 4496.0 | 4380.5 | 4268.1 | 4248.9 |
| 32.5° | 10978.4 | 8286.0 | 5959.4 | 5266.2 | 4887.5 | 4650.0 | 4508.8 | 4393.3 | 4277.8 | 4178.3 | 4159.0 |
| 35°   | 11636.3 | 8385.5 | 5782.9 | 5054.4 | 4714.2 | 4528.1 | 4431.8 | 4297.0 | 4155.8 | 4046.7 | 4037.1 |
| 37.5° | 12316.6 | 8462.5 | 5571.1 | 4852.2 | 4563.4 | 4457.5 | 4377.3 | 4194.3 | 4017.8 | 3886.3 | 3870.2 |
| 40°   | 12974.5 | 8526.7 | 5307.9 | 4662.9 | 4425.4 | 4406.1 | 4297.0 | 4069.2 | 3764.3 | 3616.7 | 3603.9 |
| 42.5° | 13587.5 | 8545.9 | 5031.9 | 4460.7 | 4300.2 | 4290.6 | 4168.7 | 3815.7 | 3581.4 | 3488.3 | 3475.5 |
| 45°   | 14007.9 | 8529.9 | 4746.3 | 4271.4 | 4175.1 | 4123.7 | 3995.4 | 3632.7 | 3488.3 | 3404.9 | 3388.8 |
| 47.5° | 14319.1 | 8446.4 | 4425.4 | 4072.4 | 4033.9 | 3963.3 | 3687.3 | 3517.2 | 3382.4 | 3299.0 | 3282.9 |
| 50°   | 14264.6 | 8099.8 | 4101.3 | 3879.8 | 3863.8 | 3802.8 | 3462.7 | 3372.8 | 3254.1 | 3164.2 | 3151.4 |
| 52.5° | 13982.2 | 7442.0 | 3770.7 | 3668.0 | 3700.1 | 3581.4 | 3302.2 | 3199.5 | 3096.8 | 2994.1 | 2971.7 |
| 55°   | 14052.8 | 6967.0 | 3520.4 | 3462.7 | 3520.4 | 3250.9 | 3122.5 | 3013.4 | 2917.1 | 2817.6 | 2798.4 |
| 57.5° | 14360.9 | 6498.5 | 3254.1 | 3241.2 | 3302.2 | 2997.3 | 2891.4 | 2753.4 | 2615.4 | 2535.2 | 2535.2 |
| 60°   | 12059.9 | 4736.7 | 2785.5 | 2817.6 | 2955.6 | 2791.9 | 2698.9 | 2557.7 | 2406.8 | 2336.2 | 2336.2 |
| 62.5° | 7130.7  | 2971.7 | 2310.6 | 2275.3 | 2361.9 | 2464.6 | 2516.0 | 2400.4 | 2220.7 | 2127.7 | 2130.9 |
| 65°   | 3141.7  | 2163.0 | 2037.8 | 2008.9 | 1983.2 | 2053.8 | 2195.0 | 2204.7 | 2015.3 | 1906.2 | 1909.4 |
| 67.5° | 1935.1  | 1957.6 | 1906.2 | 1883.8 | 1861.3 | 1848.5 | 1835.6 | 1842.0 | 1790.7 | 1691.2 | 1688.0 |
| 70°   | 1745.8  | 1806.7 | 1771.4 | 1752.2 | 1723.3 | 1700.8 | 1623.8 | 1498.7 | 1412.0 | 1386.3 | 1415.2 |
| 72.5° | 1501.9  | 1585.3 | 1566.1 | 1556.4 | 1521.1 | 1466.6 | 1363.9 | 1241.9 | 1139.2 | 1075.1 | 1087.9 |
| 75°   | 1132.8  | 1200.2 | 1209.8 | 1213.1 | 1174.5 | 1123.2 | 1017.3 | 914.6  | 824.7  | 757.4  | 773.4  |
| 77.5° | 651.5   | 690.0  | 699.6  | 709.2  | 680.3  | 661.1  | 590.5  | 516.7  | 468.5  | 397.9  | 417.2  |
| 80°   | 362.6   | 378.7  | 378.7  | 381.9  | 365.8  | 343.4  | 295.2  | 253.5  | 231.1  | 199.0  | 202.2  |
| 82.5° | 218.2   | 224.6  | 227.8  | 231.1  | 221.4  | 199.0  | 163.7  | 134.8  | 121.9  | 105.9  | 102.7  |
| 85°   | 105.9   | 112.3  | 112.3  | 115.5  | 99.5   | 86.6   | 67.4   | 51.3   | 44.9   | 32.1   | 35.3   |
| 87.5° | 25.7    | 28.9   | 28.9   | 25.7   | 22.5   | 16.0   | 9.6    | 3.2    | 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    |



LM-79-08: Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Report Prepared for

Cooper Lighting Solutions

MCGRAW, INVUE, LUMARK AND STREETWORKS

DATA VALID FOR LUMINIAIRES UTILIZING SA LIGHT ENGINES

Report Number: SP1-2101-121-2

Luminaire Tested: IFLD-S-SA2A-740-U-T3R-HSS

Test Date: 03/05/2021

**Test Information**

Test Method: LM-79-08  
 Report Number: SP1-2101-121-2  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1  
 Measurement Geometry: 4π  
 Issue Date: 03/05/2021  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: STREETWORKS  
 Catalog Number: **IFLD-S-SA2A-740-U-T3R-HSS**  
 Description: STREETWORKS INF FLOOD

SHIELD, DRIVER PROGRAMMED @ 615mA.

**Spectral Parameters**

|                           |         |           |      |      |       |
|---------------------------|---------|-----------|------|------|-------|
| CCT (K):                  | 3905    | CRI (Ra): | 71.2 | R9:  | -29.7 |
| CIE u':                   | 0.2273  | R1:       | 68.9 | R10: | 46.2  |
| CIE v':                   | 0.5024  | R2:       | 77.0 | R11: | 68.8  |
| Duv:                      | -0.0008 | R3:       | 84.0 | R12: | 45.6  |
| CIE x:                    | 0.3841  | R4:       | 71.6 | R13: | 69.5  |
| CIE y:                    | 0.3774  | R5:       | 68.9 | R14: | 90.7  |
| CIE z:                    | 0.2385  | R6:       | 68.3 |      |       |
| Peak Wavelength (nm):     | 443     | R7:       | 78.7 |      |       |
| Dominant Wavelength (nm): | 579     | R8:       | 52.2 |      |       |
| Purity:                   | 28.7    |           |      |      |       |
| Rf:                       | 71.7    |           |      |      |       |
| Rg:                       | 96.9    |           |      |      |       |



**Test Conditions**

Stabilization Time: 211M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 24.8/312%  
 Sphere Temperature (°C): 24.1

REPORT NUMBER: SP1-2101-121-2

| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | IN0058                | 1/31/2021        | 7/31/2021            |
| Power Meter                    | IN0071                | 12/1/2020        | 12/1/2021            |
| AC Power Source                | IN0063                | 12/1/2020        | 12/1/2021            |
| DC Power Source                | IN0208                | 12/1/2020        | 12/1/2021            |
| Sphere Thermometer             | IN0085                | 12/1/2020        | 12/1/2021            |
| Room Thermometer               | IN0046                | 12/1/2020        | 12/1/2021            |

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CIE 1931 Chromaticity Diagram



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



Point lies inside the ANSI 4000K 4-step quadrangle

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**Photopic Flux vs. Wavelength**



#####

| λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) |
|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|
| 360    | 2304          | 0.0           | 490    | 19043         | 2.7           | 620    | 97577         | 25.4          | 750    | 4830          | 0.0           | 880    | 3505          | 0.0           |
| 365    | 2150          | 0.0           | 495    | 26606         | 4.8           | 625    | 90158         | 19.9          | 755    | 4664          | 0.0           | 885    | 2991          | 0.0           |
| 370    | 2146          | 0.0           | 500    | 36376         | 8.0           | 630    | 82240         | 14.9          | 760    | 4006          | 0.0           | 890    | 2327          | 0.0           |
| 375    | 2332          | 0.0           | 505    | 47714         | 13.3          | 635    | 74361         | 11.2          | 765    | 3715          | 0.0           | 895    | 2775          | 0.0           |
| 380    | 2527          | 0.0           | 510    | 58741         | 20.2          | 640    | 66994         | 8.0           | 770    | 3696          | 0.0           | 900    | 2141          | 0.0           |
| 385    | 2304          | 0.0           | 515    | 68716         | 28.5          | 645    | 60405         | 5.8           | 775    | 3117          | 0.0           | 905    | 2421          | 0.0           |
| 390    | 2064          | 0.0           | 520    | 77136         | 37.4          | 650    | 53806         | 3.9           | 780    | 3062          | 0.0           | 910    | 2200          | 0.0           |
| 395    | 1856          | 0.0           | 525    | 83567         | 44.9          | 655    | 47610         | 2.7           | 785    | 2907          | 0.0           | 915    | 2716          | 0.0           |
| 400    | 1856          | 0.0           | 530    | 89283         | 52.6          | 660    | 42018         | 1.8           | 790    | 2655          | 0.0           | 920    | 2656          | 0.0           |
| 405    | 2374          | 0.0           | 535    | 94097         | 58.4          | 665    | 36742         | 1.2           | 795    | 2467          | 0.0           | 925    | 2671          | 0.0           |
| 410    | 4084          | 0.0           | 540    | 96845         | 63.1          | 670    | 32105         | 0.7           | 800    | 2609          | 0.0           | 930    | 3292          | 0.0           |
| 415    | 8543          | 0.0           | 545    | 100829        | 67.1          | 675    | 27946         | 0.5           | 805    | 2293          | 0.0           | 935    | 3188          | 0.0           |
| 420    | 18394         | 0.1           | 550    | 105648        | 71.8          | 680    | 24146         | 0.3           | 810    | 2188          | 0.0           | 940    | 1997          | 0.0           |
| 425    | 37987         | 0.2           | 555    | 110017        | 75.1          | 685    | 21191         | 0.2           | 815    | 2386          | 0.0           | 945    | 2623          | 0.0           |
| 430    | 67605         | 0.5           | 560    | 114586        | 77.9          | 690    | 18544         | 0.1           | 820    | 2712          | 0.0           | 950    | 2969          | 0.0           |
| 435    | 102160        | 1.2           | 565    | 118987        | 79.1          | 695    | 16058         | 0.1           | 825    | 2473          | 0.0           | 955    | 2277          | 0.0           |
| 440    | 135103        | 2.1           | 570    | 122326        | 79.5          | 700    | 14133         | 0.0           | 830    | 1969          | 0.0           | 960    | 4267          | 0.0           |
| 445    | 140126        | 2.9           | 575    | 125968        | 78.4          | 705    | 12309         | 0.0           | 835    | 1917          | 0.0           | 965    | 2034          | 0.0           |
| 450    | 102339        | 2.7           | 580    | 127613        | 75.8          | 710    | 11142         | 0.0           | 840    | 2248          | 0.0           | 970    | 3586          | 0.0           |
| 455    | 58751         | 2.0           | 585    | 129466        | 71.9          | 715    | 10143         | 0.0           | 845    | 2266          | 0.0           | 975    | 2505          | 0.0           |
| 460    | 36892         | 1.5           | 590    | 128813        | 66.6          | 720    | 9072          | 0.0           | 850    | 2558          | 0.0           | 980    | 2666          | 0.0           |
| 465    | 24637         | 1.3           | 595    | 126387        | 59.9          | 725    | 8130          | 0.0           | 855    | 2767          | 0.0           | 985    | 2934          | 0.0           |
| 470    | 16738         | 1.0           | 600    | 123477        | 53.2          | 730    | 7149          | 0.0           | 860    | 2826          | 0.0           | 990    | 4120          | 0.0           |
| 475    | 13456         | 1.1           | 605    | 118718        | 46.0          | 735    | 6311          | 0.0           | 865    | 2385          | 0.0           | 995    | 3858          | 0.0           |
| 480    | 13081         | 1.2           | 610    | 112091        | 38.5          | 740    | 5711          | 0.0           | 870    | 3194          | 0.0           | 1000   | 3405          | 0.0           |
| 485    | 14734         | 1.7           | 615    | 105039        | 31.7          | 745    | 5111          | 0.0           | 875    | 3189          | 0.0           |        |               |               |

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**Scotopic Flux vs. Wavelength**



**Scotopic Lumens: 10425.8 S/P: 1.47**

| 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    | 2304          | 0.0           | 490    | 19043         | 29.3          | 620    | 97577         | 1.2           | 750    | 4830          | 0.0           | 880    | 3505          | 0.0           |
| 365    | 2150          | 0.0           | 495    | 26606         | 43.0          | 625    | 90158         | 0.8           | 755    | 4664          | 0.0           | 885    | 2991          | 0.0           |
| 370    | 2146          | 0.0           | 500    | 36376         | 60.8          | 630    | 82240         | 0.5           | 760    | 4006          | 0.0           | 890    | 2327          | 0.0           |
| 375    | 2332          | 0.0           | 505    | 47714         | 81.1          | 635    | 74361         | 0.3           | 765    | 3715          | 0.0           | 895    | 2775          | 0.0           |
| 380    | 2527          | 0.0           | 510    | 58741         | 99.6          | 640    | 66994         | 0.2           | 770    | 3696          | 0.0           | 900    | 2141          | 0.0           |
| 385    | 2304          | 0.0           | 515    | 68716         | 113.9         | 645    | 60405         | 0.1           | 775    | 3117          | 0.0           | 905    | 2421          | 0.0           |
| 390    | 2064          | 0.0           | 520    | 77136         | 122.6         | 650    | 53806         | 0.1           | 780    | 3062          | 0.0           | 910    | 2200          | 0.0           |
| 395    | 1856          | 0.0           | 525    | 83567         | 125.0         | 655    | 47610         | 0.0           | 785    | 2907          | 0.0           | 915    | 2716          | 0.0           |
| 400    | 1856          | 0.0           | 530    | 89283         | 123.1         | 660    | 42018         | 0.0           | 790    | 2655          | 0.0           | 920    | 2656          | 0.0           |
| 405    | 2374          | 0.1           | 535    | 94097         | 117.3         | 665    | 36742         | 0.0           | 795    | 2467          | 0.0           | 925    | 2671          | 0.0           |
| 410    | 4084          | 0.2           | 540    | 96845         | 107.0         | 670    | 32105         | 0.0           | 800    | 2609          | 0.0           | 930    | 3292          | 0.0           |
| 415    | 8543          | 0.9           | 545    | 100829        | 96.7          | 675    | 27946         | 0.0           | 805    | 2293          | 0.0           | 935    | 3188          | 0.0           |
| 420    | 18394         | 3.0           | 550    | 105648        | 86.4          | 680    | 24146         | 0.0           | 810    | 2188          | 0.0           | 940    | 1997          | 0.0           |
| 425    | 37987         | 9.3           | 555    | 110017        | 75.2          | 685    | 21191         | 0.0           | 815    | 2386          | 0.0           | 945    | 2623          | 0.0           |
| 430    | 67605         | 23.0          | 560    | 114586        | 64.0          | 690    | 18544         | 0.0           | 820    | 2712          | 0.0           | 950    | 2969          | 0.0           |
| 435    | 102160        | 45.7          | 565    | 118987        | 53.4          | 695    | 16058         | 0.0           | 825    | 2473          | 0.0           | 955    | 2277          | 0.0           |
| 440    | 135103        | 75.5          | 570    | 122326        | 43.2          | 700    | 14133         | 0.0           | 830    | 1969          | 0.0           | 960    | 4267          | 0.0           |
| 445    | 140126        | 93.8          | 575    | 125968        | 34.3          | 705    | 12309         | 0.0           | 835    | 1917          | 0.0           | 965    | 2034          | 0.0           |
| 450    | 102339        | 79.3          | 580    | 127613        | 26.3          | 710    | 11142         | 0.0           | 840    | 2248          | 0.0           | 970    | 3586          | 0.0           |
| 455    | 58751         | 51.3          | 585    | 129466        | 19.8          | 715    | 10143         | 0.0           | 845    | 2266          | 0.0           | 975    | 2505          | 0.0           |
| 460    | 36892         | 35.6          | 590    | 128813        | 14.3          | 720    | 9072          | 0.0           | 850    | 2558          | 0.0           | 980    | 2666          | 0.0           |
| 465    | 24637         | 26.0          | 595    | 126387        | 10.1          | 725    | 8130          | 0.0           | 855    | 2767          | 0.0           | 985    | 2934          | 0.0           |
| 470    | 16738         | 19.3          | 600    | 123477        | 7.0           | 730    | 7149          | 0.0           | 860    | 2826          | 0.0           | 990    | 4120          | 0.0           |
| 475    | 13456         | 16.8          | 605    | 118718        | 4.7           | 735    | 6311          | 0.0           | 865    | 2385          | 0.0           | 995    | 3858          | 0.0           |
| 480    | 13081         | 17.7          | 610    | 112091        | 3.0           | 740    | 5711          | 0.0           | 870    | 3194          | 0.0           | 1000   | 3405          | 0.0           |
| 485    | 14734         | 21.4          | 615    | 105039        | 1.9           | 745    | 5111          | 0.0           | 875    | 3189          | 0.0           |        |               |               |

REPORT NUMBER: SP1-2101-121-2

**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: 3927.2 M/P: 0.55**

| 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    | 2304          | 0.0           | 490    | 19043         | 15.8          | 620    | 97577         | 0.1           | 750    | 4830          | 0.0           | 880    | 3505          | 0.0           |
| 365    | 2150          | 0.0           | 495    | 26606         | 22.0          | 625    | 90158         | 0.0           | 755    | 4664          | 0.0           | 885    | 2991          | 0.0           |
| 370    | 2146          | 0.0           | 500    | 36376         | 29.2          | 630    | 82240         | 0.0           | 760    | 4006          | 0.0           | 890    | 2327          | 0.0           |
| 375    | 2332          | 0.0           | 505    | 47714         | 36.6          | 635    | 74361         | 0.0           | 765    | 3715          | 0.0           | 895    | 2775          | 0.0           |
| 380    | 2527          | 0.0           | 510    | 58741         | 42.2          | 640    | 66994         | 0.0           | 770    | 3696          | 0.0           | 900    | 2141          | 0.0           |
| 385    | 2304          | 0.0           | 515    | 68716         | 44.9          | 645    | 60405         | 0.0           | 775    | 3117          | 0.0           | 905    | 2421          | 0.0           |
| 390    | 2064          | 0.0           | 520    | 77136         | 44.9          | 650    | 53806         | 0.0           | 780    | 3062          | 0.0           | 910    | 2200          | 0.0           |
| 395    | 1856          | 0.0           | 525    | 83567         | 42.4          | 655    | 47610         | 0.0           | 785    | 2907          | 0.0           | 915    | 2716          | 0.0           |
| 400    | 1856          | 0.0           | 530    | 89283         | 38.6          | 660    | 42018         | 0.0           | 790    | 2655          | 0.0           | 920    | 2656          | 0.0           |
| 405    | 2374          | 0.0           | 535    | 94097         | 33.9          | 665    | 36742         | 0.0           | 795    | 2467          | 0.0           | 925    | 2671          | 0.0           |
| 410    | 4084          | 0.2           | 540    | 96845         | 28.3          | 670    | 32105         | 0.0           | 800    | 2609          | 0.0           | 930    | 3292          | 0.0           |
| 415    | 8543          | 0.6           | 545    | 100829        | 23.4          | 675    | 27946         | 0.0           | 805    | 2293          | 0.0           | 935    | 3188          | 0.0           |
| 420    | 18394         | 2.1           | 550    | 105648        | 19.0          | 680    | 24146         | 0.0           | 810    | 2188          | 0.0           | 940    | 1997          | 0.0           |
| 425    | 37987         | 5.9           | 555    | 110017        | 14.8          | 685    | 21191         | 0.0           | 815    | 2386          | 0.0           | 945    | 2623          | 0.0           |
| 430    | 67605         | 14.3          | 560    | 114586        | 11.3          | 690    | 18544         | 0.0           | 820    | 2712          | 0.0           | 950    | 2969          | 0.0           |
| 435    | 102160        | 27.3          | 565    | 118987        | 8.4           | 695    | 16058         | 0.0           | 825    | 2473          | 0.0           | 955    | 2277          | 0.0           |
| 440    | 135103        | 45.1          | 570    | 122326        | 6.0           | 700    | 14133         | 0.0           | 830    | 1969          | 0.0           | 960    | 4267          | 0.0           |
| 445    | 140126        | 55.3          | 575    | 125968        | 4.2           | 705    | 12309         | 0.0           | 835    | 1917          | 0.0           | 965    | 2034          | 0.0           |
| 450    | 102339        | 47.2          | 580    | 127613        | 2.9           | 710    | 11142         | 0.0           | 840    | 2248          | 0.0           | 970    | 3586          | 0.0           |
| 455    | 58751         | 30.8          | 585    | 129466        | 1.9           | 715    | 10143         | 0.0           | 845    | 2266          | 0.0           | 975    | 2505          | 0.0           |
| 460    | 36892         | 21.7          | 590    | 128813        | 1.3           | 720    | 9072          | 0.0           | 850    | 2558          | 0.0           | 980    | 2666          | 0.0           |
| 465    | 24637         | 16.1          | 595    | 126387        | 0.8           | 725    | 8130          | 0.0           | 855    | 2767          | 0.0           | 985    | 2934          | 0.0           |
| 470    | 16738         | 12.0          | 600    | 123477        | 0.5           | 730    | 7149          | 0.0           | 860    | 2826          | 0.0           | 990    | 4120          | 0.0           |
| 475    | 13456         | 10.3          | 605    | 118718        | 0.3           | 735    | 6311          | 0.0           | 865    | 2385          | 0.0           | 995    | 3858          | 0.0           |
| 480    | 13081         | 10.5          | 610    | 112091        | 0.2           | 740    | 5711          | 0.0           | 870    | 3194          | 0.0           | 1000   | 3405          | 0.0           |
| 485    | 14734         | 12.1          | 615    | 105039        | 0.1           | 745    | 5111          | 0.0           | 875    | 3189          | 0.0           |        |               |               |

**Summary**

$R_f = 71.7$   
 $R_g = 96.9$   
 CIE  $R_a = 71.2$   
 $R_g = -29.7$



**Color Vector Graphics**





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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 55 | CES51 = 86 | CES76 = 45 |
| CES02 = 61 | CES27 = 80 | CES52 = 87 | CES77 = 68 |
| CES03 = 30 | CES28 = 79 | CES53 = 74 | CES78 = 49 |
| CES04 = 70 | CES29 = 51 | CES54 = 81 | CES79 = 77 |
| CES05 = 47 | CES30 = 60 | CES55 = 80 | CES80 = 75 |
| CES06 = 50 | CES31 = 56 | CES56 = 69 | CES81 = 75 |
| CES07 = 40 | CES32 = 52 | CES57 = 67 | CES82 = 90 |
| CES08 = 39 | CES33 = 62 | CES58 = 69 | CES83 = 85 |
| CES09 = 29 | CES34 = 65 | CES59 = 86 | CES84 = 87 |
| CES10 = 74 | CES35 = 81 | CES60 = 91 | CES85 = 83 |
| CES11 = 57 | CES36 = 92 | CES61 = 85 | CES86 = 72 |
| CES12 = 63 | CES37 = 74 | CES62 = 81 | CES87 = 77 |
| CES13 = 42 | CES38 = 69 | CES63 = 72 | CES88 = 77 |
| CES14 = 74 | CES39 = 92 | CES64 = 69 | CES89 = 72 |
| CES15 = 71 | CES40 = 86 | CES65 = 64 | CES90 = 75 |
| CES16 = 46 | CES41 = 84 | CES66 = 63 | CES91 = 91 |
| CES17 = 49 | CES42 = 75 | CES67 = 60 | CES92 = 66 |
| CES18 = 56 | CES43 = 70 | CES68 = 67 | CES93 = 80 |
| CES19 = 72 | CES44 = 98 | CES69 = 77 | CES94 = 56 |
| CES20 = 65 | CES45 = 80 | CES70 = 57 | CES95 = 72 |
| CES21 = 86 | CES46 = 77 | CES71 = 53 | CES96 = 78 |
| CES22 = 78 | CES47 = 74 | CES72 = 84 | CES97 = 83 |
| CES23 = 92 | CES48 = 66 | CES73 = 47 | CES98 = 73 |
| CES24 = 91 | CES49 = 76 | CES74 = 96 | CES99 = 63 |
| CES25 = 72 | CES50 = 85 | CES75 = 52 |            |



Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)