

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: P642678

Luminaire Tested: GWS-SA6D-735-U-T3-W-HSS

Issue Date: 1/10/2023

### Test Information

Test Method: LM-79-2019  
Report Number: P642678  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2209-782-26)  
Test Lab: COOPER LIGHTING SOLUTIONS  
Issue Date: 1/10/2023  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: McGRAW-EDISON  
Catalog Number: GWS-SA6D-735-U-T3-W-HSS  
Description: GALLEON WALL SLIM LUMINAIRE. (6) LIGHTSQUARES WITH 16 LEDS EACH AND  
TYPE III OPTICS WITH HOUSE SIDE SHIELD  
Light Source: (96) 3500K CCT, 70 CRI LEDS  
Ballast/Driver: -

### Summary

Lumens per Lamp: N/A  
Luminaire Lumens: 25938 lumens  
Efficiency: N/A  
Efficacy: 105.6 lumens/watt  
Luminous Opening: Rectangular (W 2' x L: 1' x H: 0')  
IES Classification: Type III - Short  
BUG Rating: B2 - U0 - G4

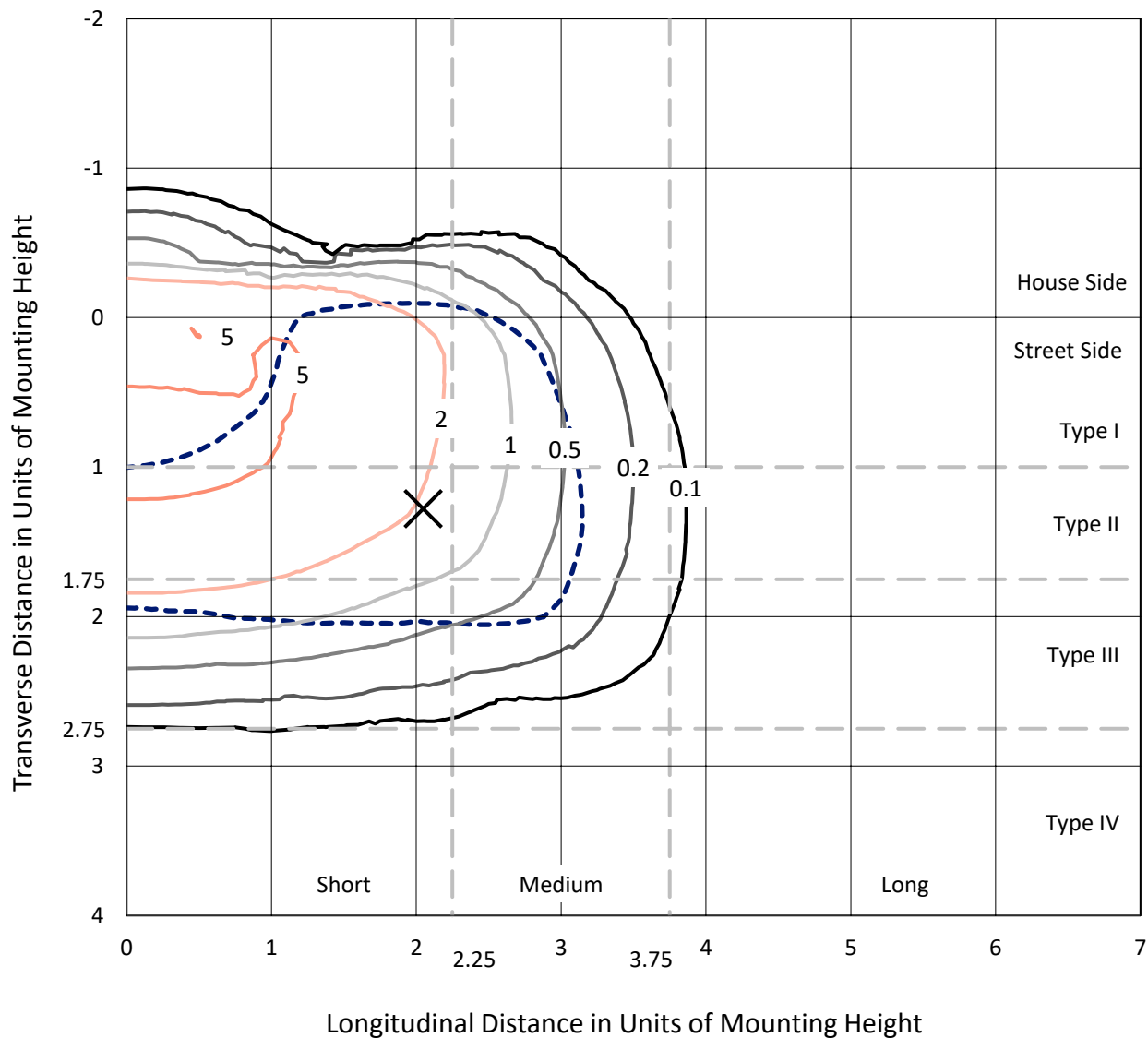
Input Watts (W): 245.7  
Input Voltage (V): 120  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 0  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 28.75 FT



REPORT NUMBER: P642678  
 CATALOG NUMBER: GWS-SA6D-735-U-T3-W-HSS

## Iso-Footcandle Lines of Horizontal Illumination

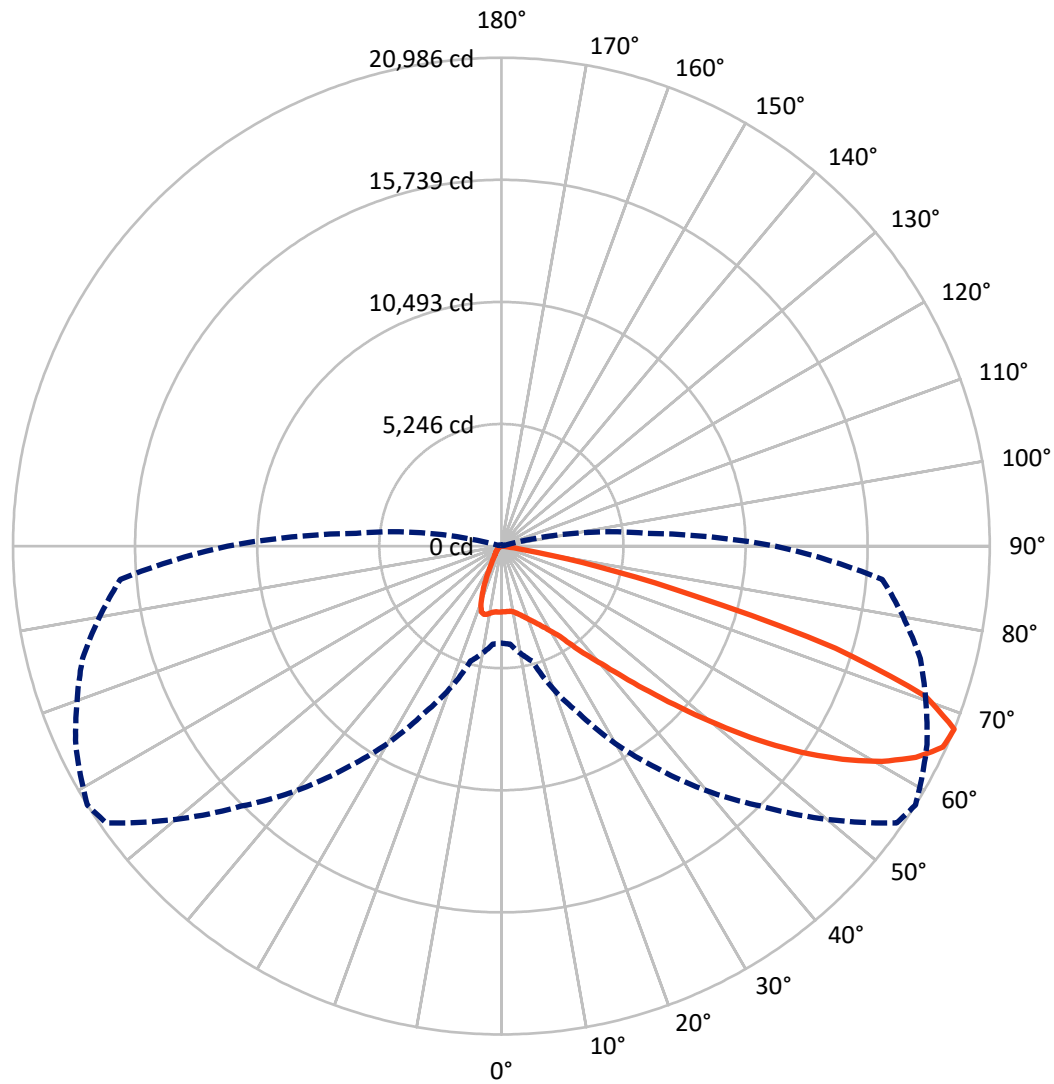
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 6.3 fc  
 Type III - Short - N/A

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## Luminous Intensity Polar Plot



— Vertical Plane Through 58-Deg Lateral    - - - Horizontal Cone Through 67.5-Deg Vertical

REPORT NUMBER: P642678

CATALOG NUMBER: GWS-SA6D-735-U-T3-W-HSS

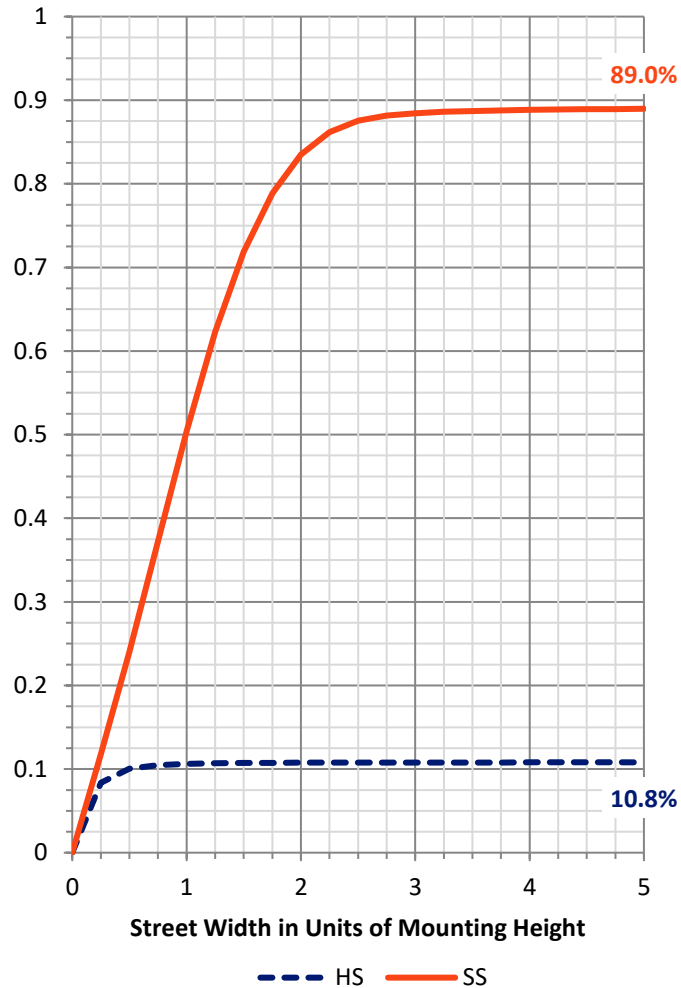
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 2829.8   | 0.0    | 2829.8  |
|                    | % Fixture | 10.9     | 0.0    | 10.9    |
| <b>Street Side</b> | Lumens    | 23108.2  | 0.0    | 23108.2 |
|                    | % Fixture | 89.1     | 0.0    | 89.1    |
| <b>Total</b>       | Lumens    | 25938.0  | 0.0    | 25938.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 265.5   | 1.0       |
| 10°-20°   | 745.5   | 2.9       |
| 20°-30°   | 1301.3  | 5.0       |
| 30°-40°   | 2323.9  | 9.0       |
| 40°-50°   | 4247.6  | 16.4      |
| 50°-60°   | 7064.2  | 27.2      |
| 60°-70°   | 7673.0  | 29.6      |
| 70°-80°   | 2252.9  | 8.7       |
| 80°-90°   | 64.2    | 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°    | 25938.0 | 100.0     |
| 0°-180°   | 25938.0 | 100.0     |

**Coefficient of Utilization**



REPORT NUMBER: P642678

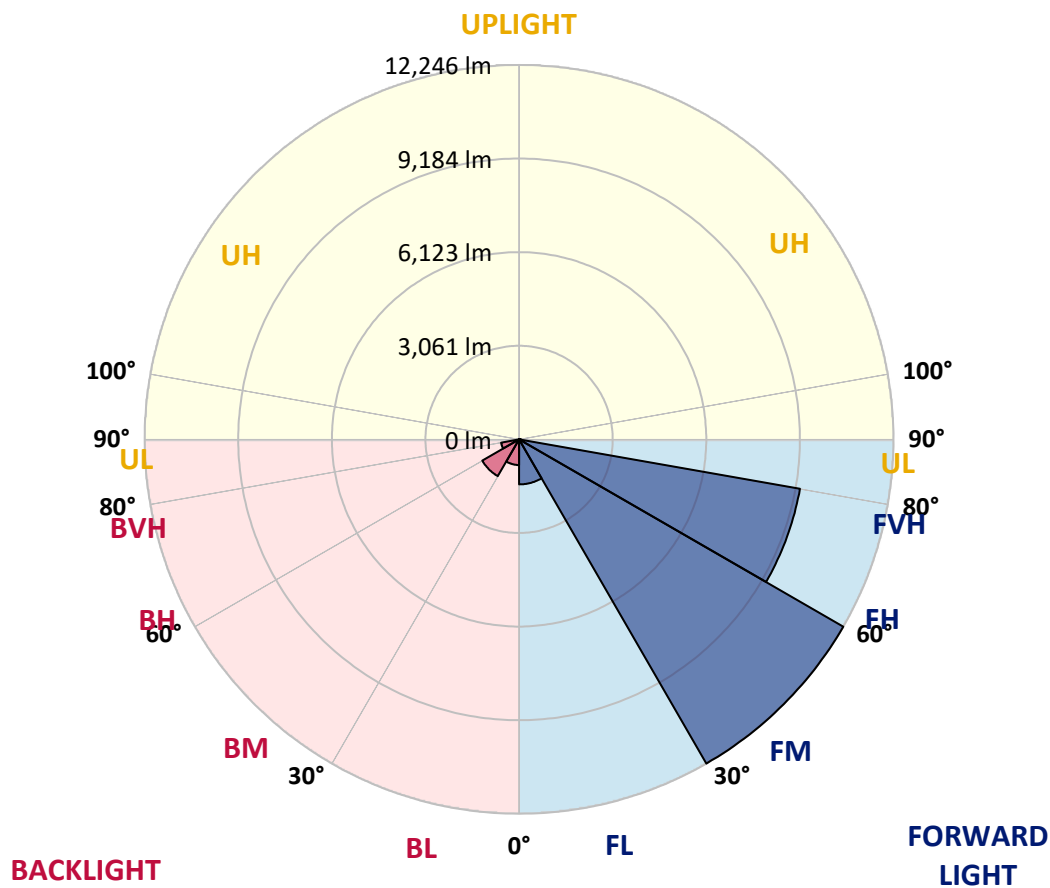
CATALOG NUMBER: GWS-SA6D-735-U-T3-W-HSS

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

| Zone |             | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |          |
|------|-------------|---------|-----------|-------------------------|------|----------|
|      |             |         |           | B                       | U    | G        |
| FL   | (0°-30°)    | 1472.9  | 5.7       |                         |      |          |
| FM   | (30°-60°)   | 12245.9 | 47.2      |                         |      |          |
| FH   | (60°-80°)   | 9328.5  | 36.0      |                         |      | G4/12000 |
| FVH  | (80°-90°)   | 61.0    | 0.2       |                         |      | G1/100   |
| BL   | (0°-30°)    | 839.4   | 3.2       | B2/1000                 |      |          |
| BM   | (30°-60°)   | 1389.9  | 5.4       | B2/2500                 |      |          |
| BH   | (60°-80°)   | 597.4   | 2.3       | B2/1000                 |      | G2/1000  |
| BVH  | (80°-90°)   | 3.2     | 0.0       |                         |      | G0/10    |
| UL   | (90°-100°)  | 0.0     | 0.0       |                         | U0/0 |          |
| UH   | (100°-180°) | 0.0     | 0.0       |                         | U0/0 |          |

**BUG Rating: B2-U0-G4**

Type III Short





REPORT NUMBER: P642678

CATALOG NUMBER: GWS-SA6D-735-U-T3-W-HSS

**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 45°     | 55°     | 58°     | 65°     | 75°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 2826.5  | 2826.5  | 2826.5  | 2826.5  | 2826.5  | 2826.5  | 2826.5  | 2826.5  | 2826.5  | 2826.5  | 2826.5  |
| 2.5°  | 2773.3  | 2768.2  | 2768.2  | 2788.5  | 2791.0  | 2801.1  | 2823.9  | 2826.5  | 2839.1  | 2834.1  | 2816.3  |
| 5°    | 2628.9  | 2631.5  | 2646.6  | 2682.1  | 2712.5  | 2750.5  | 2806.2  | 2818.9  | 2846.7  | 2861.9  | 2851.8  |
| 7.5°  | 2494.7  | 2497.2  | 2520.0  | 2575.7  | 2634.0  | 2710.0  | 2801.1  | 2826.5  | 2882.2  | 2922.7  | 2925.2  |
| 10°   | 2444.0  | 2441.5  | 2464.3  | 2527.6  | 2603.6  | 2710.0  | 2841.7  | 2874.6  | 2958.2  | 3029.1  | 3041.7  |
| 12.5° | 2459.2  | 2456.7  | 2479.5  | 2537.7  | 2621.3  | 2755.6  | 2912.6  | 2958.2  | 3064.5  | 3173.4  | 3196.2  |
| 15°   | 2520.0  | 2517.5  | 2532.7  | 2580.8  | 2672.0  | 2811.3  | 3003.8  | 3072.1  | 3206.4  | 3338.1  | 3373.5  |
| 17.5° | 2702.4  | 2689.7  | 2674.5  | 2679.6  | 2732.8  | 2877.1  | 3120.3  | 3203.8  | 3371.0  | 3528.0  | 3558.4  |
| 20°   | 3026.5  | 2993.6  | 2953.1  | 2899.9  | 2874.6  | 2973.4  | 3254.5  | 3350.7  | 3553.3  | 3733.2  | 3738.2  |
| 22.5° | 3515.4  | 3502.7  | 3409.0  | 3254.5  | 3145.6  | 3148.1  | 3411.5  | 3523.0  | 3771.2  | 3968.7  | 3940.8  |
| 25°   | 4196.6  | 4189.0  | 4044.7  | 3791.4  | 3507.8  | 3411.5  | 3611.6  | 3725.6  | 4029.5  | 4239.7  | 4151.1  |
| 27.5° | 5042.6  | 4989.4  | 4819.7  | 4477.8  | 4054.8  | 3753.4  | 3864.9  | 3966.2  | 4303.0  | 4500.6  | 4333.4  |
| 30°   | 5779.6  | 5782.1  | 5622.5  | 5265.4  | 4789.3  | 4267.6  | 4173.9  | 4262.5  | 4553.8  | 4761.4  | 4558.8  |
| 32.5° | 6488.7  | 6511.5  | 6336.8  | 6015.1  | 5493.4  | 4938.7  | 4617.1  | 4632.3  | 4875.4  | 5100.8  | 4855.1  |
| 35°   | 7147.2  | 7164.9  | 7043.4  | 6769.8  | 6283.6  | 5640.3  | 5235.0  | 5227.4  | 5359.1  | 5589.6  | 5268.0  |
| 37.5° | 7884.2  | 7902.0  | 7782.9  | 7537.2  | 7081.4  | 6443.1  | 5936.6  | 5926.5  | 5979.6  | 6167.1  | 5799.8  |
| 40°   | 8669.4  | 8702.3  | 8570.6  | 8362.9  | 7927.3  | 7387.8  | 6752.1  | 6660.9  | 6607.8  | 6828.1  | 6488.7  |
| 42.5° | 9464.6  | 9515.3  | 9469.7  | 9262.0  | 8889.7  | 8443.9  | 7810.8  | 7668.9  | 7555.0  | 7831.0  | 7471.4  |
| 45°   | 10452.4 | 10513.1 | 10492.9 | 10333.3 | 10044.6 | 9682.4  | 9084.7  | 8920.1  | 8866.9  | 9122.7  | 8694.7  |
| 47.5° | 11402.1 | 11468.0 | 11541.4 | 11505.9 | 11300.8 | 11133.6 | 10470.1 | 10376.4 | 10361.2 | 10634.7 | 9971.1  |
| 50°   | 12108.7 | 12169.5 | 12450.6 | 12653.3 | 12792.5 | 12757.1 | 12182.2 | 12042.9 | 12020.1 | 12194.8 | 11318.5 |
| 52.5° | 12615.3 | 12673.5 | 13061.0 | 13694.2 | 14205.8 | 14484.4 | 13904.4 | 13874.0 | 13749.9 | 13689.1 | 12579.8 |
| 55°   | 13007.8 | 13088.9 | 13496.6 | 14454.0 | 15484.8 | 16102.8 | 15740.6 | 15631.7 | 15312.6 | 14963.1 | 13749.9 |
| 57.5° | 13086.3 | 13119.3 | 13694.2 | 14985.8 | 16477.6 | 17478.0 | 17478.0 | 17288.1 | 16672.6 | 16188.9 | 15102.4 |
| 60°   | 12382.3 | 12483.6 | 13261.1 | 14942.8 | 16903.1 | 18377.1 | 18919.1 | 18787.4 | 17956.7 | 17361.5 | 16404.1 |
| 62.5° | 10819.6 | 10933.6 | 11880.8 | 13912.0 | 16477.6 | 18562.0 | 20010.7 | 19990.4 | 19053.3 | 18331.5 | 17483.1 |
| 65°   | 8297.0  | 8380.6  | 9206.3  | 11637.6 | 14679.4 | 17850.3 | 20790.7 | 20846.5 | 19919.5 | 18972.3 | 17855.4 |
| 67.5° | 4168.8  | 4227.0  | 5118.5  | 7950.1  | 11635.1 | 15801.4 | 20737.6 | 20985.8 | 20182.9 | 18632.9 | 16434.5 |
| 70°   | 1456.3  | 1514.5  | 1935.0  | 3411.5  | 7081.4  | 12065.7 | 18944.4 | 19349.6 | 18635.4 | 15905.2 | 12123.9 |
| 72.5° | 498.9   | 526.8   | 802.9   | 1266.3  | 2755.6  | 7152.3  | 14405.9 | 15016.2 | 13737.2 | 10677.8 | 6967.4  |
| 75°   | 283.7   | 301.4   | 430.6   | 686.4   | 1154.9  | 2352.9  | 8172.9  | 8547.8  | 8008.3  | 5820.1  | 2867.0  |
| 77.5° | 192.5   | 207.7   | 268.5   | 390.0   | 638.2   | 757.3   | 3333.0  | 4196.6  | 3659.7  | 1899.5  | 731.9   |
| 80°   | 114.0   | 124.1   | 164.6   | 230.5   | 326.7   | 293.8   | 714.2   | 949.8   | 1223.3  | 567.3   | 220.3   |
| 82.5° | 53.2    | 60.8    | 106.4   | 152.0   | 164.6   | 124.1   | 210.2   | 255.8   | 344.4   | 278.6   | 91.2    |
| 85°   | 0.0     | 0.0     | 35.5    | 63.3    | 60.8    | 35.5    | 58.3    | 63.3    | 93.7    | 139.3   | 35.5    |
| 87.5° | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 2.5     | 5.1     | 7.6     | 15.2    | 27.9    | 15.2    |
| 90°   | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |

REPORT NUMBER: P642678

CATALOG NUMBER: GWS-SA6D-735-U-T3-W-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°     | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 2826.5  | 2826.5 | 2826.5 | 2826.5 | 2826.5 | 2826.5 | 2826.5 | 2826.5 | 2826.5 | 2826.5 | 2826.5 |
| 2.5°  | 2836.6  | 2818.9 | 2839.1 | 2829.0 | 2839.1 | 2836.6 | 2816.3 | 2803.7 | 2803.7 | 2780.9 | 2773.3 |
| 5°    | 2872.1  | 2854.3 | 2859.4 | 2836.6 | 2831.5 | 2818.9 | 2793.5 | 2783.4 | 2783.4 | 2760.6 | 2753.0 |
| 7.5°  | 2950.6  | 2922.7 | 2917.6 | 2872.1 | 2851.8 | 2816.3 | 2770.7 | 2753.0 | 2750.5 | 2727.7 | 2720.1 |
| 10°   | 3074.7  | 3041.7 | 3019.0 | 2960.7 | 2902.4 | 2831.5 | 2735.3 | 2654.2 | 2608.7 | 2547.9 | 2542.8 |
| 12.5° | 3226.6  | 3186.1 | 3150.6 | 3062.0 | 2965.8 | 2806.2 | 2522.5 | 2226.2 | 2043.9 | 1899.5 | 1909.6 |
| 15°   | 3396.3  | 3358.3 | 3302.6 | 3168.4 | 2970.8 | 2555.5 | 1962.8 | 1506.9 | 1284.1 | 1165.0 | 1160.0 |
| 17.5° | 3581.2  | 3525.5 | 3434.3 | 3252.0 | 2811.3 | 1952.7 | 1276.5 | 901.6  | 785.1  | 744.6  | 734.5  |
| 20°   | 3753.4  | 3685.0 | 3571.1 | 3269.7 | 2350.3 | 1322.1 | 797.8  | 699.0  | 678.8  | 666.1  | 666.1  |
| 22.5° | 3935.8  | 3849.7 | 3680.0 | 3132.9 | 1747.5 | 845.9  | 678.8  | 656.0  | 640.8  | 623.0  | 620.5  |
| 25°   | 4120.7  | 4009.2 | 3778.8 | 2775.8 | 1144.8 | 666.1  | 635.7  | 610.4  | 582.5  | 554.7  | 547.1  |
| 27.5° | 4277.7  | 4133.3 | 3854.7 | 2244.0 | 734.5  | 600.2  | 580.0  | 536.9  | 498.9  | 468.5  | 463.5  |
| 30°   | 4465.1  | 4280.2 | 3887.7 | 1641.2 | 577.5  | 529.3  | 498.9  | 453.3  | 407.8  | 377.4  | 367.2  |
| 32.5° | 4715.8  | 4513.2 | 3837.0 | 1068.8 | 511.6  | 466.0  | 417.9  | 364.7  | 319.1  | 286.2  | 281.1  |
| 35°   | 5105.9  | 4865.3 | 3604.0 | 681.3  | 463.5  | 402.7  | 344.4  | 288.7  | 250.7  | 225.4  | 220.3  |
| 37.5° | 5582.0  | 5359.1 | 3221.6 | 511.6  | 415.4  | 349.5  | 281.1  | 227.9  | 200.1  | 182.4  | 177.3  |
| 40°   | 6288.6  | 5977.1 | 2748.0 | 448.3  | 367.2  | 296.3  | 230.5  | 187.4  | 167.2  | 152.0  | 146.9  |
| 42.5° | 7205.5  | 6706.5 | 2203.4 | 407.8  | 321.6  | 248.2  | 187.4  | 154.5  | 136.8  | 126.6  | 124.1  |
| 45°   | 8276.8  | 7418.2 | 1628.5 | 367.2  | 278.6  | 205.1  | 154.5  | 126.6  | 114.0  | 106.4  | 103.8  |
| 47.5° | 9373.4  | 8041.2 | 1124.5 | 324.2  | 238.1  | 169.7  | 129.2  | 108.9  | 98.8   | 88.6   | 86.1   |
| 50°   | 10543.5 | 8568.0 | 767.4  | 281.1  | 202.6  | 139.3  | 111.4  | 98.8   | 86.1   | 78.5   | 76.0   |
| 52.5° | 11402.1 | 8763.1 | 534.4  | 243.1  | 172.2  | 119.0  | 98.8   | 88.6   | 78.5   | 68.4   | 65.8   |
| 55°   | 12194.8 | 8758.0 | 405.2  | 205.1  | 146.9  | 103.8  | 88.6   | 78.5   | 68.4   | 60.8   | 58.3   |
| 57.5° | 12985.0 | 8689.6 | 319.1  | 174.8  | 126.6  | 93.7   | 78.5   | 68.4   | 63.3   | 53.2   | 50.7   |
| 60°   | 13496.6 | 8431.3 | 248.2  | 146.9  | 108.9  | 81.0   | 68.4   | 60.8   | 53.2   | 45.6   | 43.1   |
| 62.5° | 13767.6 | 8071.6 | 190.0  | 116.5  | 88.6   | 70.9   | 60.8   | 53.2   | 45.6   | 38.0   | 35.5   |
| 65°   | 13400.4 | 7433.4 | 149.4  | 91.2   | 68.4   | 60.8   | 50.7   | 43.1   | 35.5   | 27.9   | 25.3   |
| 67.5° | 11771.9 | 6268.4 | 116.5  | 73.4   | 53.2   | 45.6   | 43.1   | 35.5   | 25.3   | 20.3   | 17.7   |
| 70°   | 8319.8  | 4292.9 | 91.2   | 55.7   | 40.5   | 35.5   | 32.9   | 27.9   | 20.3   | 15.2   | 12.7   |
| 72.5° | 4566.4  | 2165.4 | 65.8   | 40.5   | 30.4   | 27.9   | 25.3   | 22.8   | 17.7   | 12.7   | 12.7   |
| 75°   | 1757.7  | 595.2  | 48.1   | 27.9   | 20.3   | 20.3   | 17.7   | 17.7   | 15.2   | 10.1   | 10.1   |
| 77.5° | 458.4   | 177.3  | 30.4   | 17.7   | 12.7   | 12.7   | 12.7   | 10.1   | 10.1   | 7.6    | 7.6    |
| 80°   | 146.9   | 58.3   | 17.7   | 12.7   | 10.1   | 7.6    | 7.6    | 5.1    | 7.6    | 5.1    | 5.1    |
| 82.5° | 48.1    | 20.3   | 10.1   | 10.1   | 7.6    | 5.1    | 5.1    | 2.5    | 2.5    | 0.0    | 0.0    |
| 85°   | 17.7    | 10.1   | 7.6    | 5.1    | 5.1    | 5.1    | 2.5    | 0.0    | 0.0    | 0.0    | 0.0    |
| 87.5° | 10.1    | 5.1    | 5.1    | 5.1    | 5.1    | 2.5    | 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    |

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

Report Prepared for

Cooper Lighting Solutions

All Brands

Data applicable to all product families using SA light engines

Report Number: SP1-2101-121-7

Luminaire Tested: IFLD-S-SA2A-735-U-T2

Test Date: 03/04/2021

### Test Information

Test Method: LM-79-08  
 Report Number: SP1-2101-121-7  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1  
 Measurement Geometry:  $4\pi$   
 Issue Date: 03/04/2021  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: STREETWORKS  
 Catalog Number: **IFLD-S-SA2A-735-U-T2**  
 Description: STREETWORKS INF FLOOD

PROGRAMMED @ 615mA.

### Spectral Parameters

|                           |        |           |      |      |       |
|---------------------------|--------|-----------|------|------|-------|
| CCT (K):                  | 3388   | CRI (Ra): | 73.1 |      |       |
| CIE u':                   | 0.2371 | R1:       | 68.9 | R9:  | -34.6 |
| CIE v':                   | 0.5177 | R2:       | 81.1 | R10: | 57.8  |
| Duv:                      | 0.0032 | R3:       | 93.1 | R11: | 68.6  |
| CIE x:                    | 0.4153 | R4:       | 71.6 | R12: | 53.9  |
| CIE y:                    | 0.4030 | R5:       | 69.4 | R13: | 70.9  |
| CIE z:                    | 0.1817 | R6:       | 75.0 | R14: | 96.2  |
| Peak Wavelength (nm):     | 590    | R7:       | 79.5 |      |       |
| Dominant Wavelength (nm): | 580    | R8:       | 46.4 |      |       |
| Purity:                   | 45.7   |           |      |      |       |
| Rf:                       | 76.9   |           |      |      |       |
| Rg:                       | 94.4   |           |      |      |       |



### Test Conditions

Stabilization Time: 81M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 25.0/30%  
 Sphere Temperature (°C): 24.1

REPORT NUMBER: SP1-2101-121-7

| 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            |

REPORT NUMBER: SP1-2101-121-7

**CIE 1931 Chromaticity Diagram**



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



Point lies inside the ANSI 3500K 4-step quadrangle

REPORT NUMBER: SP1-2101-121-7

### Photopic Flux vs. Wavelength



#####

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 2672             | 0.0              | 490       | 34553            | 4.9              | 620       | 136720           | 35.6             | 750       | 5870             | 0.0              | 880       | 4216             | 0.0              |
| 365       | 2252             | 0.0              | 495       | 44336            | 8.0              | 625       | 126308           | 27.9             | 755       | 5421             | 0.0              | 885       | 4132             | 0.0              |
| 370       | 2217             | 0.0              | 500       | 54643            | 12.1             | 630       | 114625           | 20.7             | 760       | 5097             | 0.0              | 890       | 3992             | 0.0              |
| 375       | 2697             | 0.0              | 505       | 64676            | 18.1             | 635       | 103216           | 15.5             | 765       | 4626             | 0.0              | 895       | 3214             | 0.0              |
| 380       | 3039             | 0.0              | 510       | 73825            | 25.4             | 640       | 92605            | 11.1             | 770       | 3782             | 0.0              | 900       | 2580             | 0.0              |
| 385       | 2655             | 0.0              | 515       | 81872            | 33.9             | 645       | 83234            | 8.0              | 775       | 3506             | 0.0              | 905       | 1776             | 0.0              |
| 390       | 2357             | 0.0              | 520       | 88574            | 43.0             | 650       | 73263            | 5.4              | 780       | 3507             | 0.0              | 910       | 3995             | 0.0              |
| 395       | 2186             | 0.0              | 525       | 93289            | 50.1             | 655       | 64627            | 3.7              | 785       | 3267             | 0.0              | 915       | 4288             | 0.0              |
| 400       | 2015             | 0.0              | 530       | 98393            | 57.9             | 660       | 56614            | 2.4              | 790       | 2849             | 0.0              | 920       | 2446             | 0.0              |
| 405       | 2234             | 0.0              | 535       | 103269           | 64.0             | 665       | 49537            | 1.6              | 795       | 3037             | 0.0              | 925       | 3009             | 0.0              |
| 410       | 3412             | 0.0              | 540       | 107316           | 69.9             | 670       | 42866            | 0.9              | 800       | 2716             | 0.0              | 930       | 3026             | 0.0              |
| 415       | 6135             | 0.0              | 545       | 113101           | 75.3             | 675       | 36708            | 0.6              | 805       | 2648             | 0.0              | 935       | 4734             | 0.0              |
| 420       | 12146            | 0.0              | 550       | 120690           | 82.0             | 680       | 31814            | 0.4              | 810       | 3187             | 0.0              | 940       | 3719             | 0.0              |
| 425       | 23983            | 0.1              | 555       | 128583           | 87.8             | 685       | 27485            | 0.2              | 815       | 2931             | 0.0              | 945       | 1480             | 0.0              |
| 430       | 42142            | 0.3              | 560       | 137796           | 93.6             | 690       | 23698            | 0.1              | 820       | 2717             | 0.0              | 950       | 3450             | 0.0              |
| 435       | 68228            | 0.8              | 565       | 146577           | 97.5             | 695       | 20309            | 0.1              | 825       | 2236             | 0.0              | 955       | 5051             | 0.0              |
| 440       | 99323            | 1.6              | 570       | 154581           | 100.5            | 700       | 17890            | 0.1              | 830       | 2628             | 0.0              | 960       | 3176             | 0.0              |
| 445       | 115584           | 2.4              | 575       | 162633           | 101.2            | 705       | 15500            | 0.0              | 835       | 3140             | 0.0              | 965       | 5178             | 0.0              |
| 450       | 94997            | 2.5              | 580       | 168101           | 99.9             | 710       | 13699            | 0.0              | 840       | 3675             | 0.0              | 970       | 6385             | 0.0              |
| 455       | 61433            | 2.1              | 585       | 173145           | 96.2             | 715       | 12398            | 0.0              | 845       | 3283             | 0.0              | 975       | 3810             | 0.0              |
| 460       | 43373            | 1.8              | 590       | 174675           | 90.3             | 720       | 11147            | 0.0              | 850       | 3055             | 0.0              | 980       | 4322             | 0.0              |
| 465       | 32472            | 1.7              | 595       | 173724           | 82.3             | 725       | 9761             | 0.0              | 855       | 2932             | 0.0              | 985       | 4200             | 0.0              |
| 470       | 24257            | 1.5              | 600       | 171241           | 73.8             | 730       | 8651             | 0.0              | 860       | 3382             | 0.0              | 990       | 4661             | 0.0              |
| 475       | 21690            | 1.7              | 605       | 165134           | 64.0             | 735       | 7730             | 0.0              | 865       | 2605             | 0.0              | 995       | 6746             | 0.0              |
| 480       | 23173            | 2.2              | 610       | 156652           | 53.8             | 740       | 6847             | 0.0              | 870       | 3325             | 0.0              | 1000      | 4150             | 0.0              |
| 485       | 27564            | 3.3              | 615       | 147879           | 44.6             | 745       | 6124             | 0.0              | 875       | 3325             | 0.0              |           |                  |                  |

REPORT NUMBER: SP1-2101-121-7

### Scotopic Flux vs. Wavelength



Scotopic Lumens: 12126

S/P: 1.36

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 2672             | 0.0              | 490       | 34553            | 53.2             | 620       | 136720           | 1.7              | 750       | 5870             | 0.0              | 880       | 4216             | 0.0              |
| 365       | 2252             | 0.0              | 495       | 44336            | 71.7             | 625       | 126308           | 1.1              | 755       | 5421             | 0.0              | 885       | 4132             | 0.0              |
| 370       | 2217             | 0.0              | 500       | 54643            | 91.4             | 630       | 114625           | 0.6              | 760       | 5097             | 0.0              | 890       | 3992             | 0.0              |
| 375       | 2697             | 0.0              | 505       | 64676            | 110.0            | 635       | 103216           | 0.4              | 765       | 4626             | 0.0              | 895       | 3214             | 0.0              |
| 380       | 3039             | 0.0              | 510       | 73825            | 125.1            | 640       | 92605            | 0.2              | 770       | 3782             | 0.0              | 900       | 2580             | 0.0              |
| 385       | 2655             | 0.0              | 515       | 81872            | 135.7            | 645       | 83234            | 0.1              | 775       | 3506             | 0.0              | 905       | 1776             | 0.0              |
| 390       | 2357             | 0.0              | 520       | 88574            | 140.8            | 650       | 73263            | 0.1              | 780       | 3507             | 0.0              | 910       | 3995             | 0.0              |
| 395       | 2186             | 0.0              | 525       | 93289            | 139.6            | 655       | 64627            | 0.1              | 785       | 3267             | 0.0              | 915       | 4288             | 0.0              |
| 400       | 2015             | 0.0              | 530       | 98393            | 135.7            | 660       | 56614            | 0.0              | 790       | 2849             | 0.0              | 920       | 2446             | 0.0              |
| 405       | 2234             | 0.1              | 535       | 103269           | 128.7            | 665       | 49537            | 0.0              | 795       | 3037             | 0.0              | 925       | 3009             | 0.0              |
| 410       | 3412             | 0.2              | 540       | 107316           | 118.6            | 670       | 42866            | 0.0              | 800       | 2716             | 0.0              | 930       | 3026             | 0.0              |
| 415       | 6135             | 0.6              | 545       | 113101           | 108.4            | 675       | 36708            | 0.0              | 805       | 2648             | 0.0              | 935       | 4734             | 0.0              |
| 420       | 12146            | 2.0              | 550       | 120690           | 98.7             | 680       | 31814            | 0.0              | 810       | 3187             | 0.0              | 940       | 3719             | 0.0              |
| 425       | 23983            | 5.9              | 555       | 128583           | 87.9             | 685       | 27485            | 0.0              | 815       | 2931             | 0.0              | 945       | 1480             | 0.0              |
| 430       | 42142            | 14.3             | 560       | 137796           | 77.0             | 690       | 23698            | 0.0              | 820       | 2717             | 0.0              | 950       | 3450             | 0.0              |
| 435       | 68228            | 30.5             | 565       | 146577           | 65.8             | 695       | 20309            | 0.0              | 825       | 2236             | 0.0              | 955       | 5051             | 0.0              |
| 440       | 99323            | 55.5             | 570       | 154581           | 54.6             | 700       | 17890            | 0.0              | 830       | 2628             | 0.0              | 960       | 3176             | 0.0              |
| 445       | 115584           | 77.4             | 575       | 162633           | 44.3             | 705       | 15500            | 0.0              | 835       | 3140             | 0.0              | 965       | 5178             | 0.0              |
| 450       | 94997            | 73.6             | 580       | 168101           | 34.6             | 710       | 13699            | 0.0              | 840       | 3675             | 0.0              | 970       | 6385             | 0.0              |
| 455       | 61433            | 53.7             | 585       | 173145           | 26.5             | 715       | 12398            | 0.0              | 845       | 3283             | 0.0              | 975       | 3810             | 0.0              |
| 460       | 43373            | 41.9             | 590       | 174675           | 19.5             | 720       | 11147            | 0.0              | 850       | 3055             | 0.0              | 980       | 4322             | 0.0              |
| 465       | 32472            | 34.3             | 595       | 173724           | 13.9             | 725       | 9761             | 0.0              | 855       | 2932             | 0.0              | 985       | 4200             | 0.0              |
| 470       | 24257            | 27.9             | 600       | 171241           | 9.7              | 730       | 8651             | 0.0              | 860       | 3382             | 0.0              | 990       | 4661             | 0.0              |
| 475       | 21690            | 27.1             | 605       | 165134           | 6.5              | 735       | 7730             | 0.0              | 865       | 2605             | 0.0              | 995       | 6746             | 0.0              |
| 480       | 23173            | 31.3             | 610       | 156652           | 4.2              | 740       | 6847             | 0.0              | 870       | 3325             | 0.0              | 1000      | 4150             | 0.0              |
| 485       | 27564            | 40.0             | 615       | 147879           | 2.7              | 745       | 6124             | 0.0              | 875       | 3325             | 0.0              |           |                  |                  |

REPORT NUMBER: SP1-2101-121-7

### Melanopic Flux vs. Wavelength



Melanopic Lumens: 4490.7

M/P: 0.5

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 2672             | 0.0              | 490       | 34553            | 28.8             | 620       | 136720           | 0.1              | 750       | 5870             | 0.0              | 880       | 4216             | 0.0              |
| 365       | 2252             | 0.0              | 495       | 44336            | 36.6             | 625       | 126308           | 0.1              | 755       | 5421             | 0.0              | 885       | 4132             | 0.0              |
| 370       | 2217             | 0.0              | 500       | 54643            | 43.9             | 630       | 114625           | 0.0              | 760       | 5097             | 0.0              | 890       | 3992             | 0.0              |
| 375       | 2697             | 0.0              | 505       | 64676            | 49.6             | 635       | 103216           | 0.0              | 765       | 4626             | 0.0              | 895       | 3214             | 0.0              |
| 380       | 3039             | 0.0              | 510       | 73825            | 53.0             | 640       | 92605            | 0.0              | 770       | 3782             | 0.0              | 900       | 2580             | 0.0              |
| 385       | 2655             | 0.0              | 515       | 81872            | 53.5             | 645       | 83234            | 0.0              | 775       | 3506             | 0.0              | 905       | 1776             | 0.0              |
| 390       | 2357             | 0.0              | 520       | 88574            | 51.6             | 650       | 73263            | 0.0              | 780       | 3507             | 0.0              | 910       | 3995             | 0.0              |
| 395       | 2186             | 0.0              | 525       | 93289            | 47.3             | 655       | 64627            | 0.0              | 785       | 3267             | 0.0              | 915       | 4288             | 0.0              |
| 400       | 2015             | 0.0              | 530       | 98393            | 42.5             | 660       | 56614            | 0.0              | 790       | 2849             | 0.0              | 920       | 2446             | 0.0              |
| 405       | 2234             | 0.0              | 535       | 103269           | 37.2             | 665       | 49537            | 0.0              | 795       | 3037             | 0.0              | 925       | 3009             | 0.0              |
| 410       | 3412             | 0.1              | 540       | 107316           | 31.4             | 670       | 42866            | 0.0              | 800       | 2716             | 0.0              | 930       | 3026             | 0.0              |
| 415       | 6135             | 0.4              | 545       | 113101           | 26.3             | 675       | 36708            | 0.0              | 805       | 2648             | 0.0              | 935       | 4734             | 0.0              |
| 420       | 12146            | 1.4              | 550       | 120690           | 21.7             | 680       | 31814            | 0.0              | 810       | 3187             | 0.0              | 940       | 3719             | 0.0              |
| 425       | 23983            | 3.7              | 555       | 128583           | 17.3             | 685       | 27485            | 0.0              | 815       | 2931             | 0.0              | 945       | 1480             | 0.0              |
| 430       | 42142            | 8.9              | 560       | 137796           | 13.6             | 690       | 23698            | 0.0              | 820       | 2717             | 0.0              | 950       | 3450             | 0.0              |
| 435       | 68228            | 18.2             | 565       | 146577           | 10.3             | 695       | 20309            | 0.0              | 825       | 2236             | 0.0              | 955       | 5051             | 0.0              |
| 440       | 99323            | 33.2             | 570       | 154581           | 7.6              | 700       | 17890            | 0.0              | 830       | 2628             | 0.0              | 960       | 3176             | 0.0              |
| 445       | 115584           | 45.6             | 575       | 162633           | 5.4              | 705       | 15500            | 0.0              | 835       | 3140             | 0.0              | 965       | 5178             | 0.0              |
| 450       | 94997            | 43.8             | 580       | 168101           | 3.8              | 710       | 13699            | 0.0              | 840       | 3675             | 0.0              | 970       | 6385             | 0.0              |
| 455       | 61433            | 32.2             | 585       | 173145           | 2.6              | 715       | 12398            | 0.0              | 845       | 3283             | 0.0              | 975       | 3810             | 0.0              |
| 460       | 43373            | 25.6             | 590       | 174675           | 1.7              | 720       | 11147            | 0.0              | 850       | 3055             | 0.0              | 980       | 4322             | 0.0              |
| 465       | 32472            | 21.2             | 595       | 173724           | 1.1              | 725       | 9761             | 0.0              | 855       | 2932             | 0.0              | 985       | 4200             | 0.0              |
| 470       | 24257            | 17.4             | 600       | 171241           | 0.7              | 730       | 8651             | 0.0              | 860       | 3382             | 0.0              | 990       | 4661             | 0.0              |
| 475       | 21690            | 16.6             | 605       | 165134           | 0.5              | 735       | 7730             | 0.0              | 865       | 2605             | 0.0              | 995       | 6746             | 0.0              |
| 480       | 23173            | 18.6             | 610       | 156652           | 0.3              | 740       | 6847             | 0.0              | 870       | 3325             | 0.0              | 1000      | 4150             | 0.0              |
| 485       | 27564            | 22.7             | 615       | 147879           | 0.2              | 745       | 6124             | 0.0              | 875       | 3325             | 0.0              |           |                  |                  |

REPORT NUMBER: SP1-2101-121-7

TM-30-18

### Summary

$R_f = 76.9$   
 $R_g = 94.4$   
 CIE  $R_a = 73.1$   
 $R_g = -34.6$

### Spectral Power Distribution Comparison



### Color Vector Graphics



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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 68 | CES51 = 90 | CES76 = 63 |
| CES02 = 62 | CES27 = 88 | CES52 = 89 | CES77 = 80 |
| CES03 = 31 | CES28 = 87 | CES53 = 80 | CES78 = 65 |
| CES04 = 70 | CES29 = 67 | CES54 = 84 | CES79 = 87 |
| CES05 = 48 | CES30 = 74 | CES55 = 84 | CES80 = 86 |
| CES06 = 51 | CES31 = 71 | CES56 = 75 | CES81 = 75 |
| CES07 = 40 | CES32 = 67 | CES57 = 74 | CES82 = 94 |
| CES08 = 39 | CES33 = 74 | CES58 = 76 | CES83 = 91 |
| CES09 = 29 | CES34 = 78 | CES59 = 87 | CES84 = 89 |
| CES10 = 75 | CES35 = 89 | CES60 = 93 | CES85 = 80 |
| CES11 = 58 | CES36 = 98 | CES61 = 86 | CES86 = 66 |
| CES12 = 64 | CES37 = 86 | CES62 = 89 | CES87 = 79 |
| CES13 = 43 | CES38 = 82 | CES63 = 77 | CES88 = 79 |
| CES14 = 74 | CES39 = 95 | CES64 = 74 | CES89 = 70 |
| CES15 = 71 | CES40 = 91 | CES65 = 68 | CES90 = 77 |
| CES16 = 47 | CES41 = 89 | CES66 = 71 | CES91 = 88 |
| CES17 = 50 | CES42 = 88 | CES67 = 69 | CES92 = 60 |
| CES18 = 56 | CES43 = 82 | CES68 = 74 | CES93 = 77 |
| CES19 = 72 | CES44 = 99 | CES69 = 82 | CES94 = 52 |
| CES20 = 65 | CES45 = 87 | CES70 = 67 | CES95 = 69 |
| CES21 = 86 | CES46 = 82 | CES71 = 66 | CES96 = 78 |
| CES22 = 79 | CES47 = 82 | CES72 = 88 | CES97 = 85 |
| CES23 = 92 | CES48 = 72 | CES73 = 59 | CES98 = 76 |
| CES24 = 91 | CES49 = 82 | CES74 = 97 | CES99 = 63 |
| CES25 = 72 | CES50 = 88 | CES75 = 66 |            |



**Color Rendition by Hue-Angle Bin**


**Measure Comparisons**



(END OF REPORT)