

Scaled data based on original data using  
LM-79-08 Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Test Report Prepared for  
Cooper Lighting Solutions  
(formerly Eaton)

Brand: McGRAW-EDISON

Report Number: P383713

Luminaire Tested: **GLEON-SA9D-735-U-T3R**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P383713  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-10)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA9D-735-U-T3R  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(9) 70 CRI, 3500K, 1200mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE III  
ROADWAY OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 66069.1 lumens  
Efficiency: N/A  
Efficacy: 114.9 lumens/watt  
Luminous Opening: Rectangular (W 2.5' x L: 1' x H: 0')  
IES Classification: Type IV - Medium  
BUG Rating: B4 - U0 - G5

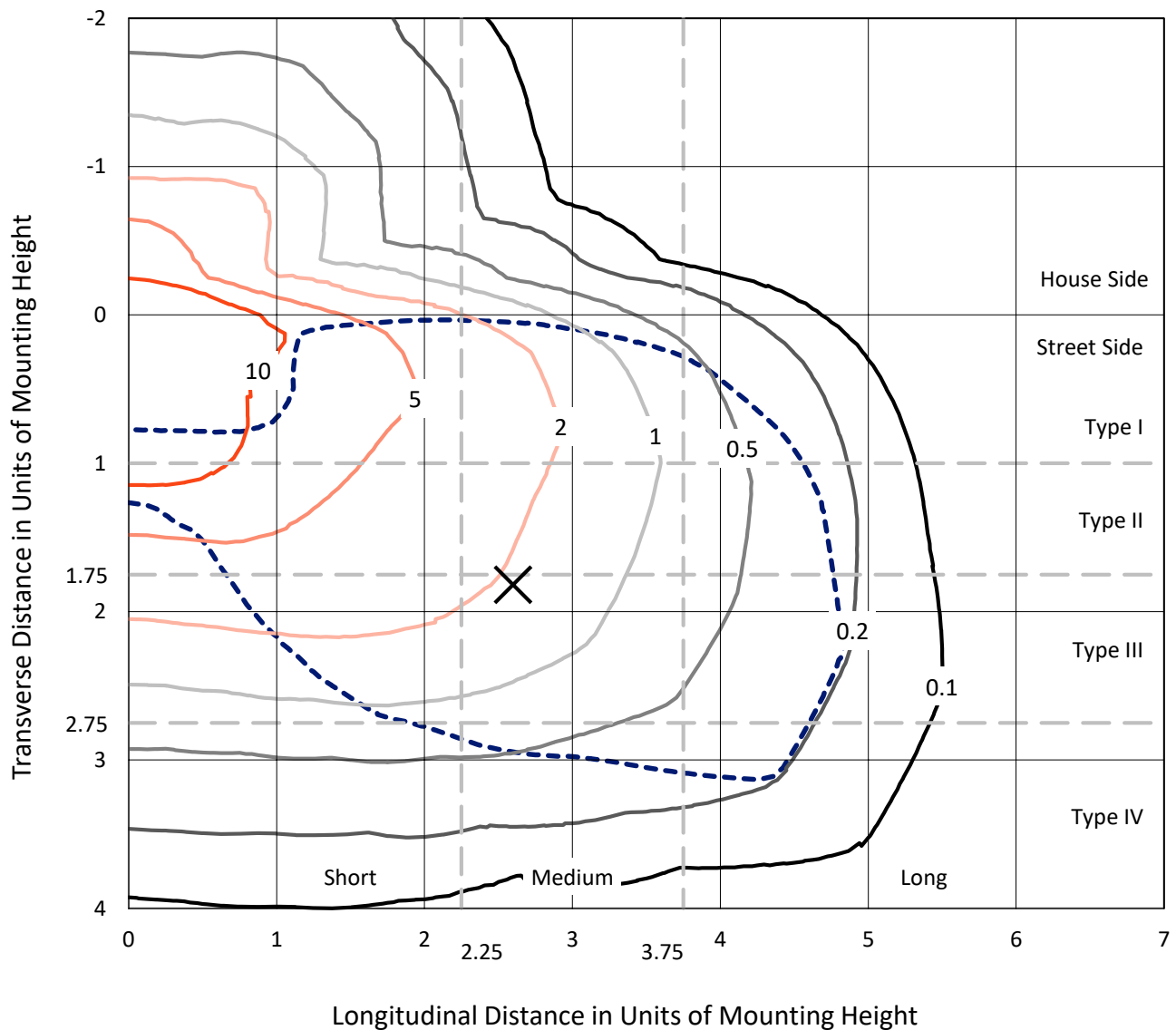
Input Watts (W): 575  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



REPORT NUMBER: P383713  
 CATALOG NUMBER: GLEON-SA9D-735-U-T3R

## Iso-Footcandle Lines of Horizontal Illumination

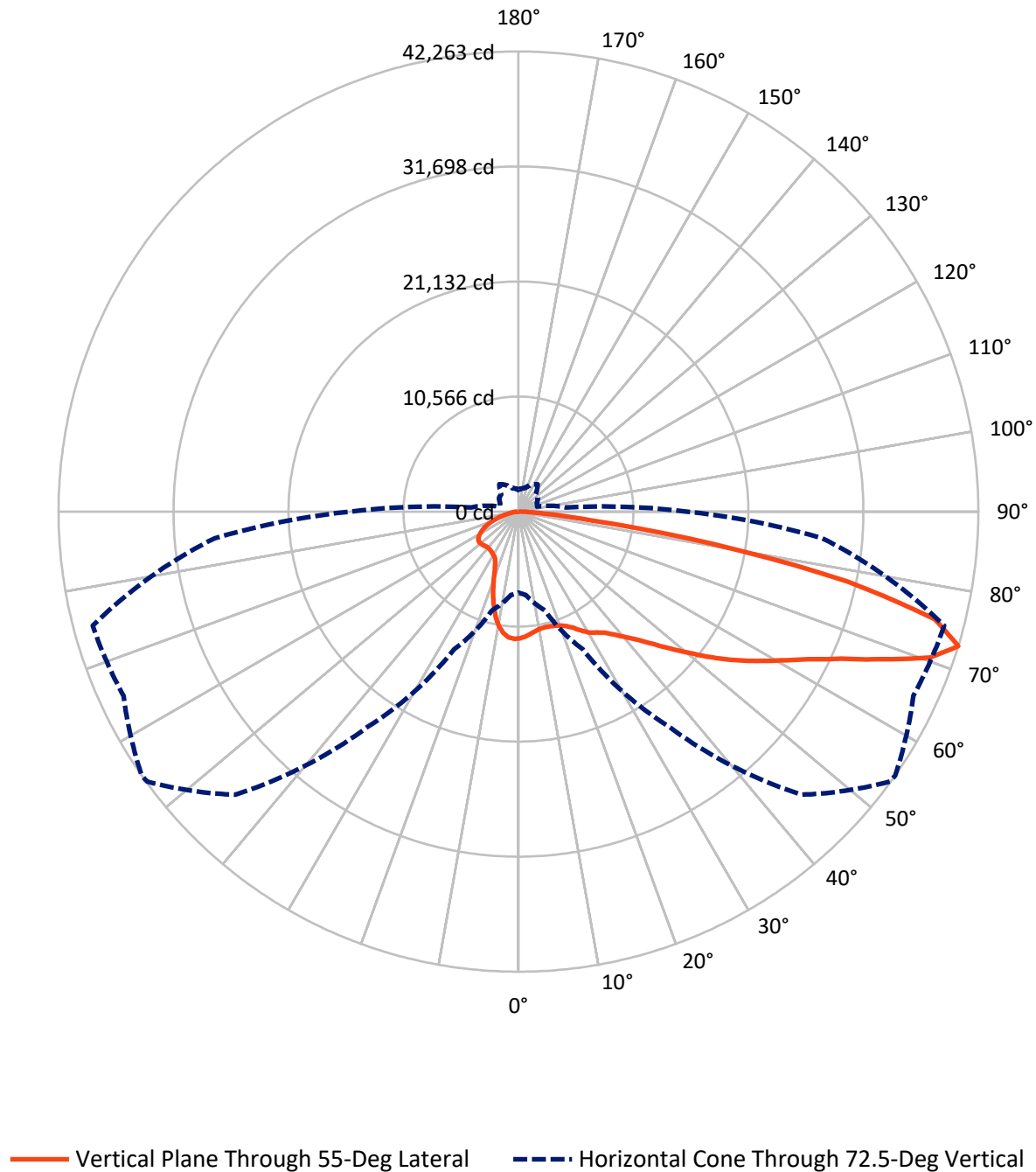
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 18.8 fc  
 Type IV - Medium - N/A

REPORT NUMBER: P383713  
CATALOG NUMBER: GLEON-SA9D-735-U-T3R

## Luminous Intensity Polar Plot



REPORT NUMBER: P383713

CATALOG NUMBER: GLEON-SA9D-735-U-T3R

**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 12280.1  | 0.0    | 12280.1 |
|                    | % Fixture | 18.6     | 0.0    | 18.6    |
| <b>Street Side</b> | Lumens    | 53789.0  | 0.0    | 53789.0 |
|                    | % Fixture | 81.4     | 0.0    | 81.4    |
| <b>Total</b>       | Lumens    | 66069.1  | 0.0    | 66069.1 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 1054.5  | 1.6       |
| 10°-20°   | 2807.4  | 4.2       |
| 20°-30°   | 4628.7  | 7.0       |
| 30°-40°   | 6847.0  | 10.4      |
| 40°-50°   | 9557.0  | 14.5      |
| 50°-60°   | 12443.5 | 18.8      |
| 60°-70°   | 15292.7 | 23.1      |
| 70°-80°   | 11987.6 | 18.1      |
| 80°-90°   | 1450.7  | 2.2       |
| 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°    | 66069.1 | 100.0     |
| 0°-180°   | 66069.1 | 100.0     |

**Coefficient of Utilization**



REPORT NUMBER: P383713

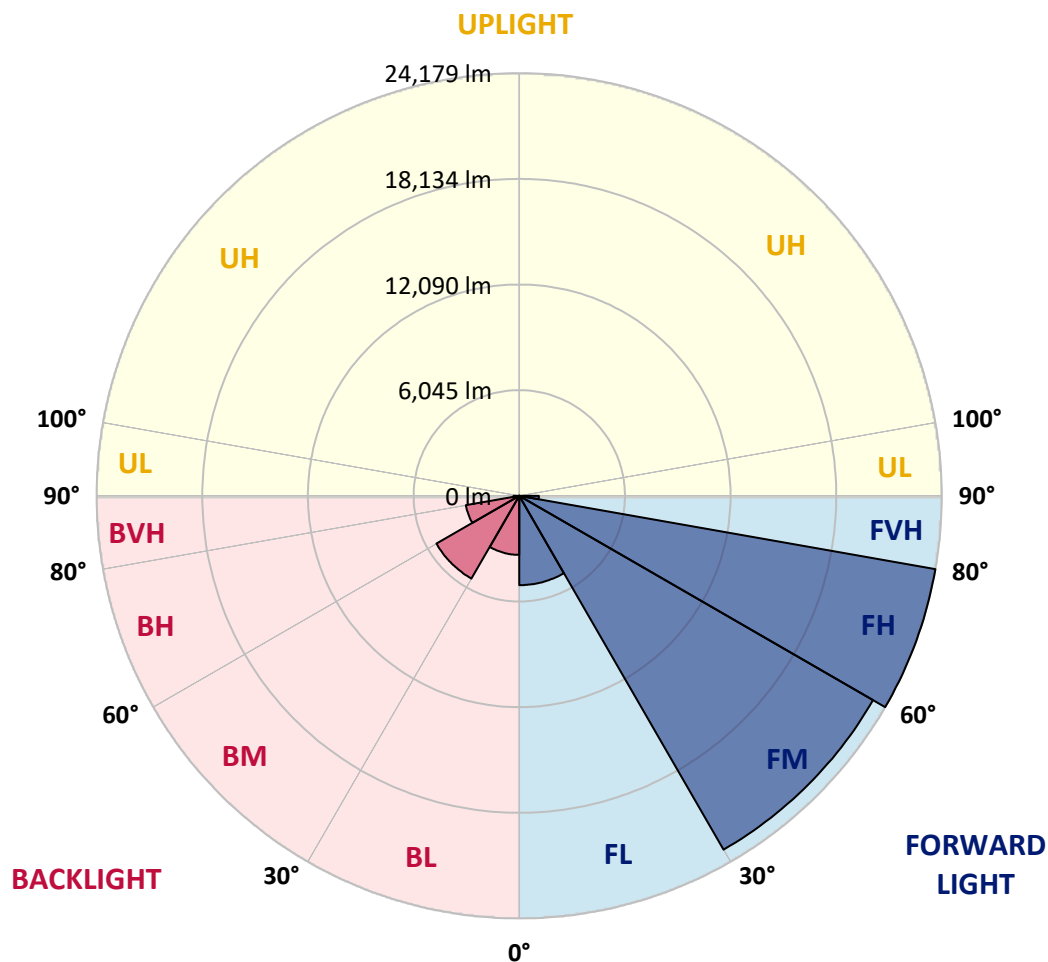
CATALOG NUMBER: GLEON-SA9D-735-U-T3R

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

| Zone |             | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|---------|-----------|-------------------------|------|---------|
|      |             |         |           | B                       | U    | G       |
| FL   | (0°-30°)    | 5111.8  | 7.7       |                         |      |         |
| FM   | (30°-60°)   | 23376.6 | 35.4      |                         |      |         |
| FH   | (60°-80°)   | 24179.1 | 36.6      |                         |      | G5      |
| FVH  | (80°-90°)   | 1121.6  | 1.7       |                         |      | G5      |
| BL   | (0°-30°)    | 3378.8  | 5.1       | B4/5000                 |      |         |
| BM   | (30°-60°)   | 5471.0  | 8.3       | B4/8500                 |      |         |
| BH   | (60°-80°)   | 3101.3  | 4.7       | B4/5000                 |      | G4/5000 |
| BVH  | (80°-90°)   | 329.1   | 0.5       |                         |      | G3/500  |
| UL   | (90°-100°)  | 0.0     | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0     | 0.0       |                         | U0/0 |         |

**BUG Rating: B4-U0-G5**

Type IV Medium



REPORT NUMBER: P383713

CATALOG NUMBER: GLEON-SA9D-735-U-T3R

**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 45°     | 54°     | 55°     | 65°     | 75°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 11653.2 | 11653.2 | 11653.2 | 11653.2 | 11653.2 | 11653.2 | 11653.2 | 11653.2 | 11653.2 | 11653.2 | 11653.2 |
| 2.5°  | 11273.8 | 11247.0 | 11280.5 | 11327.3 | 11378.7 | 11447.9 | 11488.0 | 11505.9 | 11575.0 | 11601.9 | 11659.9 |
| 5°    | 10751.6 | 10738.2 | 10794.0 | 10874.3 | 10988.2 | 11148.9 | 11278.2 | 11302.8 | 11485.8 | 11615.2 | 11733.5 |
| 7.5°  | 10372.2 | 10372.2 | 10437.0 | 10532.9 | 10660.2 | 10876.6 | 11059.6 | 11093.1 | 11403.3 | 11682.2 | 11900.9 |
| 10°   | 10071.0 | 10082.1 | 10158.1 | 10271.8 | 10421.3 | 10651.2 | 10894.4 | 10932.4 | 11380.9 | 11838.4 | 12186.5 |
| 12.5° | 9870.1  | 9896.9  | 9966.1  | 10068.7 | 10254.0 | 10532.9 | 10840.9 | 10892.2 | 11427.8 | 12061.5 | 12530.2 |
| 15°   | 9997.4  | 10042.0 | 10048.7 | 10091.1 | 10193.7 | 10497.2 | 10872.1 | 10925.7 | 11528.2 | 12289.2 | 12920.7 |
| 17.5° | 10555.3 | 10570.8 | 10501.7 | 10412.5 | 10363.4 | 10557.5 | 10965.8 | 11021.6 | 11648.7 | 12514.5 | 13295.6 |
| 20°   | 11403.3 | 11394.3 | 11244.8 | 11003.8 | 10753.9 | 10785.1 | 11119.8 | 11177.8 | 11811.7 | 12713.1 | 13670.5 |
| 22.5° | 12474.4 | 12443.1 | 12213.2 | 11769.2 | 11343.0 | 11164.4 | 11389.8 | 11438.9 | 12057.1 | 12996.6 | 14072.1 |
| 25°   | 13773.1 | 13704.0 | 13400.5 | 12804.7 | 12177.6 | 11717.8 | 11796.0 | 11842.9 | 12414.1 | 13313.4 | 14440.4 |
| 27.5° | 15143.3 | 15074.1 | 14688.1 | 13967.3 | 13132.7 | 12416.3 | 12356.1 | 12396.3 | 12820.2 | 13547.8 | 14712.6 |
| 30°   | 16576.0 | 16502.4 | 16149.8 | 15341.9 | 14145.8 | 13139.4 | 12878.3 | 12893.9 | 13105.9 | 13674.9 | 14935.8 |
| 32.5° | 18015.3 | 17946.2 | 17551.2 | 16613.9 | 15246.0 | 13915.9 | 13255.5 | 13235.3 | 13277.7 | 13806.7 | 15188.0 |
| 35°   | 19474.7 | 19501.6 | 19039.6 | 18002.0 | 16464.4 | 14779.6 | 13701.8 | 13659.4 | 13565.6 | 14076.6 | 15545.0 |
| 37.5° | 21036.9 | 21019.0 | 20420.9 | 19336.4 | 17738.6 | 15716.8 | 14342.2 | 14335.5 | 14011.9 | 14587.7 | 16105.2 |
| 40°   | 22081.2 | 22092.4 | 21728.6 | 20702.1 | 19026.2 | 16754.5 | 15163.4 | 15147.8 | 14723.8 | 15353.1 | 16839.3 |
| 42.5° | 22489.6 | 22563.2 | 22656.9 | 22005.3 | 20374.1 | 17957.3 | 16143.1 | 16120.7 | 15716.8 | 16451.0 | 17702.9 |
| 45°   | 22518.6 | 22665.9 | 23246.1 | 23163.5 | 21739.8 | 19334.2 | 17395.0 | 17332.5 | 17042.4 | 17910.4 | 18733.9 |
| 47.5° | 22268.6 | 22420.4 | 23384.5 | 23853.0 | 22960.4 | 20786.9 | 18858.8 | 18809.7 | 18559.8 | 19735.9 | 19849.7 |
| 50°   | 21721.9 | 21867.0 | 23098.8 | 24190.1 | 23964.6 | 22183.9 | 20545.9 | 20416.4 | 20282.6 | 21844.7 | 21126.1 |
| 52.5° | 20697.7 | 20976.6 | 22717.2 | 24270.4 | 24564.9 | 23424.6 | 22320.0 | 22235.2 | 22308.8 | 24069.5 | 22404.7 |
| 55°   | 18271.9 | 18584.4 | 21733.1 | 24203.4 | 25009.0 | 24466.7 | 24094.1 | 24089.6 | 24471.2 | 26403.7 | 23777.2 |
| 57.5° | 16912.9 | 17133.9 | 19729.2 | 24089.6 | 25535.7 | 25502.1 | 25850.3 | 25892.7 | 26635.8 | 28945.4 | 25214.3 |
| 60°   | 16145.3 | 16377.4 | 18713.8 | 23667.8 | 26352.4 | 26841.1 | 27642.3 | 27727.0 | 28836.1 | 31759.4 | 26943.8 |
| 62.5° | 15446.8 | 15701.2 | 18084.5 | 22808.7 | 27314.2 | 28755.8 | 29789.0 | 29864.9 | 31165.9 | 34651.5 | 28615.2 |
| 65°   | 14253.0 | 14540.8 | 17162.8 | 22244.1 | 28189.0 | 31252.9 | 32518.2 | 32569.5 | 33841.4 | 37682.0 | 29893.8 |
| 67.5° | 12565.8 | 12829.2 | 15424.5 | 20996.7 | 28836.1 | 34285.6 | 36146.7 | 36175.7 | 36494.8 | 39822.1 | 30547.7 |
| 70°   | 10595.4 | 10695.8 | 12947.5 | 18421.4 | 28070.7 | 37121.9 | 40123.3 | 40130.0 | 38913.8 | 41192.2 | 30440.6 |
| 72.5° | 7444.5  | 7681.0  | 9399.3  | 13945.0 | 24123.1 | 36776.0 | 42187.5 | 42263.4 | 40038.5 | 40500.4 | 28008.2 |
| 75°   | 4565.8  | 4815.7  | 5895.8  | 8450.9  | 15304.0 | 28923.2 | 38978.6 | 39505.2 | 37929.7 | 36111.0 | 22880.1 |
| 77.5° | 3052.8  | 3146.5  | 3847.2  | 4927.2  | 6933.4  | 16640.7 | 29967.5 | 30958.3 | 31509.5 | 26334.6 | 14632.3 |
| 80°   | 1702.7  | 1881.2  | 2550.7  | 3061.7  | 3084.0  | 6612.1  | 17968.4 | 18200.6 | 17531.1 | 10486.1 | 4514.5  |
| 82.5° | 901.6   | 999.7   | 1702.7  | 1798.6  | 1682.6  | 2213.7  | 6696.9  | 6703.6  | 5601.2  | 2811.8  | 1341.1  |
| 85°   | 698.5   | 781.0   | 1167.1  | 1097.9  | 859.2   | 981.9   | 2209.3  | 2329.7  | 1905.8  | 1151.5  | 437.4   |
| 87.5° | 348.1   | 432.9   | 792.2   | 696.2   | 336.9   | 281.1   | 790.0   | 843.5   | 752.0   | 450.8   | 158.5   |
| 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: P383713

CATALOG NUMBER: GLEON-SA9D-735-U-T3R

**CANDELA DISTRIBUTION (continued):**

|       | 90°     | 95°     | 105°    | 115°    | 125°    | 135°    | 145°    | 155°    | 165°    | 175°    | 180°    |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 11653.2 | 11653.2 | 11653.2 | 11653.2 | 11653.2 | 11653.2 | 11653.2 | 11653.2 | 11653.2 | 11653.2 | 11653.2 |
| 2.5°  | 11682.2 | 11702.3 | 11726.8 | 11700.1 | 11691.1 | 11655.4 | 11595.2 | 11581.7 | 11550.5 | 11552.8 | 11570.6 |
| 5°    | 11784.8 | 11818.3 | 11804.9 | 11702.3 | 11579.5 | 11407.7 | 11229.2 | 11077.4 | 10977.0 | 10970.3 | 10963.6 |
| 7.5°  | 11981.2 | 12003.5 | 11898.7 | 11606.3 | 11262.6 | 10865.4 | 10490.5 | 10162.5 | 9963.8  | 9914.7  | 9903.7  |
| 10°   | 12289.2 | 12284.7 | 11996.8 | 11407.7 | 10722.6 | 10013.0 | 9410.5  | 8955.2  | 8689.7  | 8611.6  | 8591.5  |
| 12.5° | 12632.8 | 12581.5 | 12030.3 | 11046.2 | 9959.5  | 8975.3  | 8212.2  | 7705.6  | 7428.8  | 7339.6  | 7317.2  |
| 15°   | 12987.6 | 12860.5 | 11947.8 | 10506.2 | 9022.1  | 7857.3  | 7056.2  | 6587.5  | 6438.0  | 6388.9  | 6380.0  |
| 17.5° | 13317.9 | 13072.4 | 11711.2 | 9774.2  | 7953.3  | 6743.8  | 6118.9  | 5931.4  | 5967.2  | 6031.9  | 6034.1  |
| 20°   | 13641.5 | 13215.2 | 11331.8 | 8850.4  | 6826.3  | 5826.6  | 5614.6  | 5753.0  | 5922.5  | 6054.2  | 6072.0  |
| 22.5° | 13960.5 | 13315.6 | 10843.1 | 7783.6  | 5817.7  | 5311.1  | 5460.6  | 5712.8  | 5906.9  | 6049.7  | 6074.2  |
| 25°   | 14228.4 | 13340.2 | 10169.1 | 6645.6  | 5117.0  | 5117.0  | 5387.0  | 5625.7  | 5817.7  | 5958.3  | 5982.8  |
| 27.5° | 14326.6 | 13175.1 | 9218.5  | 5592.3  | 4764.4  | 5027.7  | 5284.3  | 5482.9  | 5645.8  | 5795.3  | 5822.1  |
| 30°   | 14364.5 | 12869.3 | 8120.6  | 4746.5  | 4619.4  | 4931.7  | 5146.0  | 5315.6  | 5469.5  | 5610.2  | 5634.7  |
| 32.5° | 14371.2 | 12501.2 | 6955.8  | 4266.8  | 4518.9  | 4831.3  | 4974.1  | 5123.6  | 5288.8  | 5344.6  | 5353.5  |
| 35°   | 14413.6 | 12066.0 | 5728.4  | 4021.2  | 4425.1  | 4737.6  | 4851.4  | 4958.5  | 4690.7  | 4710.8  | 4728.6  |
| 37.5° | 14536.3 | 11635.3 | 4701.9  | 3882.9  | 4365.0  | 4688.5  | 4824.6  | 4436.3  | 4226.5  | 4177.4  | 4170.7  |
| 40°   | 14766.1 | 11175.6 | 3940.9  | 3771.3  | 4342.6  | 4713.1  | 4652.8  | 4141.8  | 3780.2  | 3510.3  | 3470.1  |
| 42.5° | 15085.3 | 10680.2 | 3454.5  | 3697.7  | 4358.2  | 4831.3  | 4414.0  | 3858.4  | 3258.1  | 3084.0  | 3061.7  |
| 45°   | 15444.6 | 10160.3 | 3191.1  | 3646.4  | 4411.8  | 4922.8  | 4365.0  | 3481.2  | 3014.9  | 2883.1  | 2872.0  |
| 47.5° | 15792.7 | 9524.2  | 3055.0  | 3624.0  | 4485.4  | 4849.2  | 4157.4  | 3365.2  | 2898.8  | 2829.6  | 2836.3  |
| 50°   | 16192.2 | 8950.8  | 2972.4  | 3599.5  | 4550.1  | 4802.3  | 3923.0  | 3304.9  | 2854.2  | 2938.9  | 3028.2  |
| 52.5° | 16529.1 | 8357.2  | 2898.8  | 3550.4  | 4574.6  | 4719.7  | 3862.8  | 3316.1  | 2854.2  | 3017.1  | 3101.9  |
| 55°   | 16928.5 | 7908.7  | 2814.0  | 3447.8  | 4527.8  | 4485.4  | 3820.5  | 3383.0  | 2887.6  | 2785.0  | 2793.9  |
| 57.5° | 17444.1 | 7761.4  | 2720.3  | 3287.1  | 4371.6  | 4144.0  | 3800.3  | 3447.8  | 2867.6  | 2802.8  | 2825.1  |
| 60°   | 18158.1 | 7917.5  | 2682.3  | 3077.3  | 4128.3  | 3876.2  | 3802.6  | 3414.3  | 2726.9  | 2615.4  | 2617.6  |
| 62.5° | 18838.8 | 8091.6  | 2680.1  | 2945.6  | 3829.3  | 3637.4  | 3751.2  | 3304.9  | 2655.6  | 2590.8  | 2615.4  |
| 65°   | 19061.9 | 7915.4  | 2572.9  | 2798.4  | 3492.4  | 3351.8  | 3657.5  | 3188.9  | 2602.0  | 2503.8  | 2499.3  |
| 67.5° | 18762.9 | 7368.5  | 2356.5  | 2559.6  | 3106.3  | 3019.3  | 3534.8  | 3050.5  | 2517.2  | 2436.8  | 2423.4  |
| 70°   | 17874.7 | 6147.9  | 2088.7  | 2244.9  | 2666.7  | 2644.4  | 3340.6  | 2889.8  | 2403.4  | 2334.2  | 2276.1  |
| 72.5° | 15484.7 | 4380.5  | 1760.7  | 1867.8  | 2171.3  | 2242.7  | 3072.8  | 2680.1  | 2242.7  | 2093.2  | 2003.9  |
| 75°   | 12717.6 | 3242.4  | 1446.0  | 1468.4  | 1649.1  | 1843.3  | 2704.7  | 2434.6  | 2053.0  | 1798.6  | 1729.4  |
| 77.5° | 7788.1  | 1983.8  | 1151.5  | 1160.4  | 1182.7  | 1470.6  | 2227.1  | 2160.2  | 1812.0  | 1499.6  | 1450.5  |
| 80°   | 2521.7  | 1082.3  | 832.3   | 874.7   | 807.8   | 1077.8  | 1722.8  | 1838.8  | 1555.4  | 1254.1  | 1200.6  |
| 82.5° | 959.6   | 631.5   | 562.4   | 591.3   | 560.1   | 723.1   | 1256.4  | 1472.9  | 1274.2  | 1030.9  | 839.0   |
| 85°   | 464.2   | 357.1   | 332.5   | 372.7   | 345.9   | 370.5   | 803.4   | 1084.5  | 966.3   | 671.7   | 624.8   |
| 87.5° | 165.2   | 158.5   | 127.2   | 171.9   | 147.3   | 131.6   | 245.5   | 546.7   | 638.2   | 462.0   | 412.9   |
| 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)