

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: P382972

Luminaire Tested: **GLEON-SA3B-735-U-SL4-HSS**

Issue Date: 3/3/2020

#### Test Information

Test Method: LM-79-08  
Report Number: P382972  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-25)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA3B-735-U-SL4-HSS  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(3) 70 CRI, 3500K, 800mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE IV SPILL  
LIGHT ELIMINATOR OPTICS WITH HOUSE SIDE SHIELD  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

#### Summary

Lumens per Lamp: N/A  
Luminaire Lumens: 13191.6 lumens  
Efficiency: N/A  
Efficacy: 106.4 lumens/watt  
Luminous Opening: Rectangular (W 1' x L: 1' x H: 0')  
IES Classification: Type IV - Short  
BUG Rating: B1 - U0 - G3

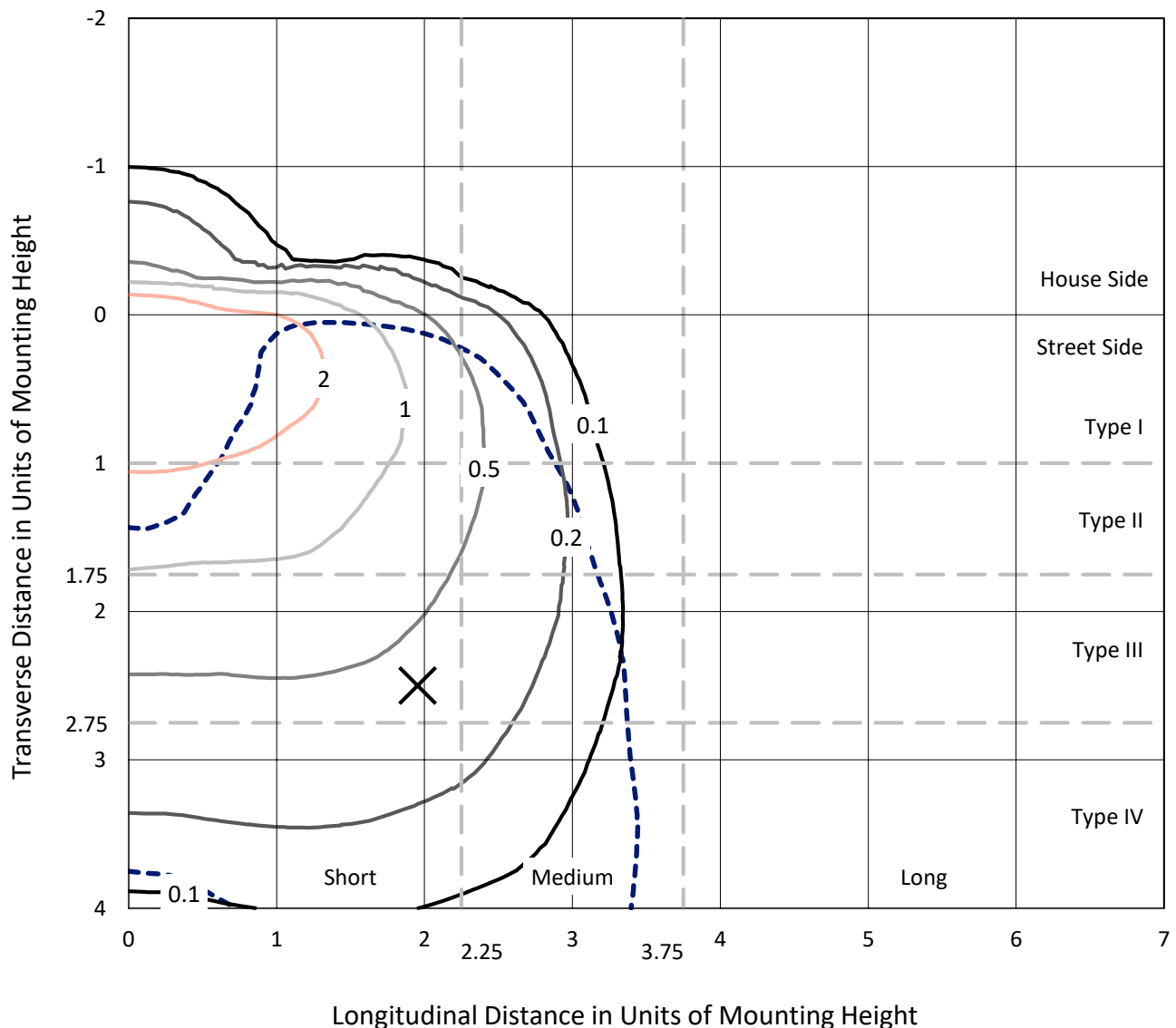
Input Watts (W): 124  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



REPORT NUMBER: P382972  
 CATALOG NUMBER: GLEON-SA3B-735-U-SL4-HSS

## Iso-Footcandle Lines of Horizontal Illumination

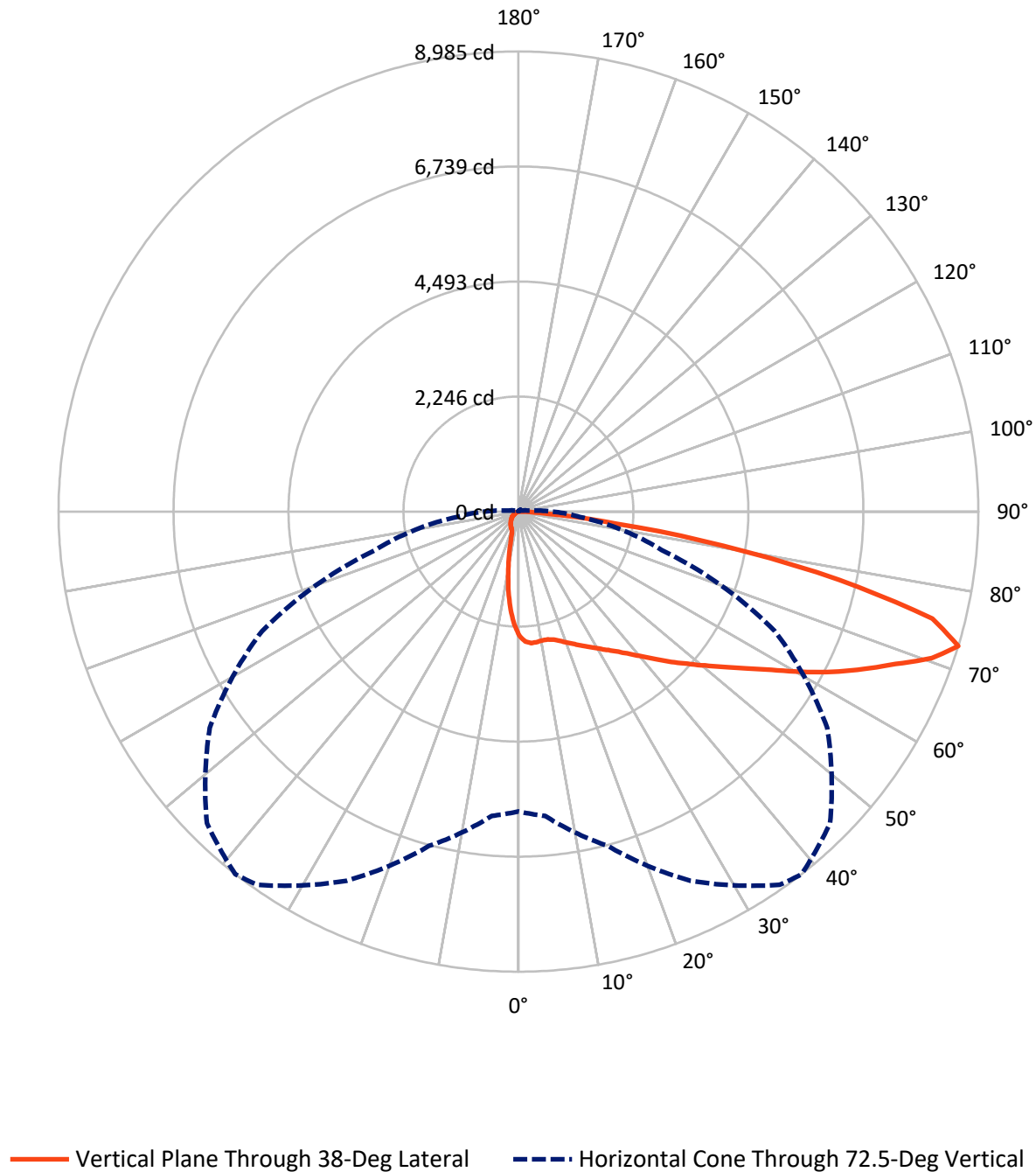
× Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 4.1 fc  
 Type IV - Short - N/A

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## Luminous Intensity Polar Plot



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**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 1110.1   | 0.0    | 1110.1  |
|                    | % Fixture | 8.4      | 0.0    | 8.4     |
| <b>Street Side</b> | Lumens    | 12081.5  | 0.0    | 12081.5 |
|                    | % Fixture | 91.6     | 0.0    | 91.6    |
| <b>Total</b>       | Lumens    | 13191.6  | 0.0    | 13191.6 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 206.7   | 1.6       |
| 10°-20°   | 505.5   | 3.8       |
| 20°-30°   | 804.0   | 6.1       |
| 30°-40°   | 1208.7  | 9.2       |
| 40°-50°   | 1844.0  | 14.0      |
| 50°-60°   | 2606.2  | 19.8      |
| 60°-70°   | 3269.0  | 24.8      |
| 70°-80°   | 2444.3  | 18.5      |
| 80°-90°   | 303.1   | 2.3       |
| 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°    | 13191.6 | 100.0     |
| 0°-180°   | 13191.6 | 100.0     |

**Coefficient of Utilization**



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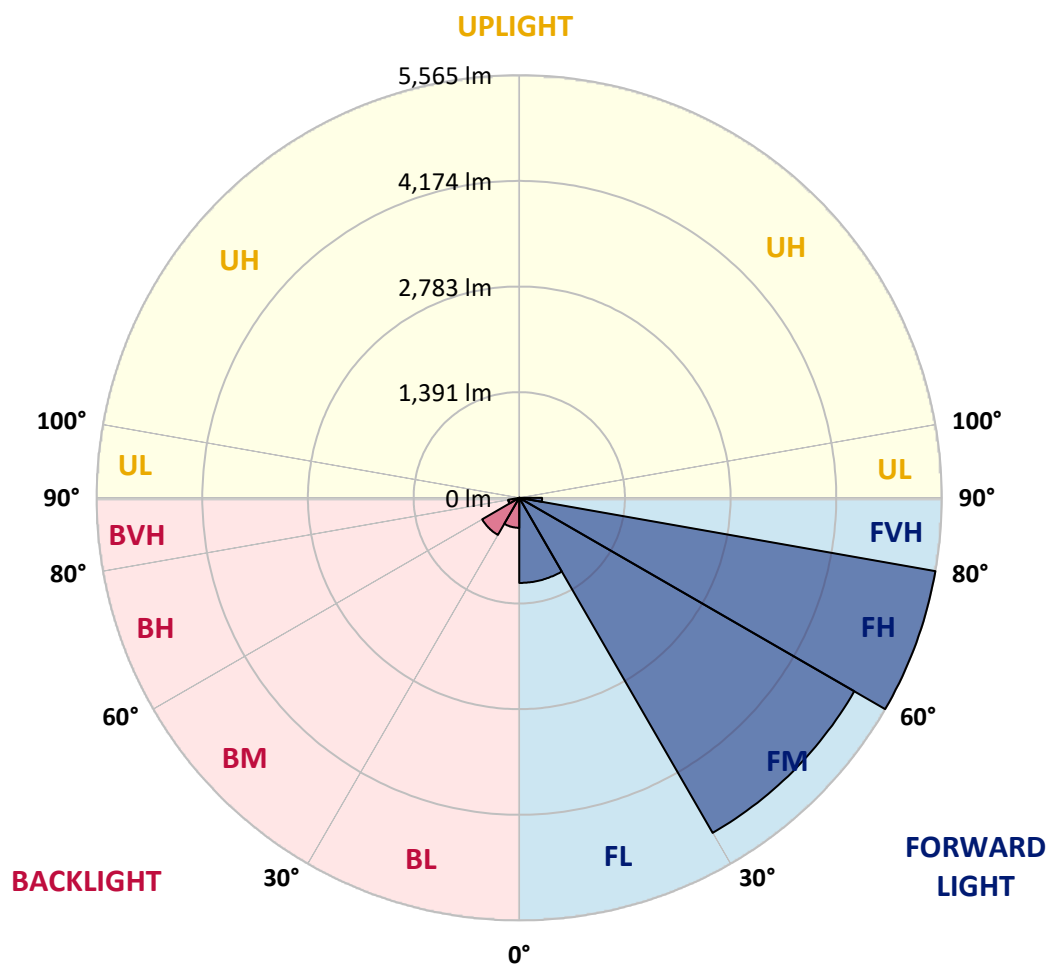
CATALOG NUMBER: GLEON-SA3B-735-U-SL4-HSS

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 1121.0 | 8.5       |                         |      |         |
| FM   | (30°-60°)   | 5095.2 | 38.6      |                         |      |         |
| FH   | (60°-80°)   | 5565.1 | 42.2      |                         |      | G3/7500 |
| FVH  | (80°-90°)   | 300.3  | 2.3       |                         |      | G3/500  |
| BL   | (0°-30°)    | 395.3  | 3.0       | B1/500                  |      |         |
| BM   | (30°-60°)   | 563.7  | 4.3       | B1/1000                 |      |         |
| BH   | (60°-80°)   | 148.3  | 1.1       | B1/500                  |      | G1/500  |
| BVH  | (80°-90°)   | 2.8    | 0.0       |                         |      | G0/10   |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B1-U0-G3**

Type IV Short





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 38°    | 45°    | 55°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 2425.9 | 2425.9 | 2425.9 | 2425.9 | 2425.9 | 2425.9 | 2425.9 | 2425.9 | 2425.9 | 2425.9 | 2425.9 |
| 2.5°  | 2574.9 | 2575.4 | 2569.4 | 2559.6 | 2546.9 | 2540.4 | 2529.4 | 2511.9 | 2493.3 | 2459.8 | 2423.7 |
| 5°    | 2627.5 | 2627.5 | 2619.9 | 2606.7 | 2586.4 | 2580.4 | 2559.6 | 2531.7 | 2493.3 | 2439.1 | 2378.2 |
| 7.5°  | 2622.0 | 2623.1 | 2612.7 | 2599.0 | 2578.7 | 2573.3 | 2548.1 | 2516.9 | 2469.2 | 2403.4 | 2325.6 |
| 10°   | 2593.5 | 2596.3 | 2588.0 | 2581.5 | 2562.9 | 2556.8 | 2533.3 | 2502.0 | 2454.3 | 2384.3 | 2295.0 |
| 12.5° | 2564.6 | 2567.3 | 2570.0 | 2576.0 | 2564.6 | 2562.3 | 2543.7 | 2517.4 | 2472.0 | 2399.0 | 2298.2 |
| 15°   | 2545.9 | 2551.3 | 2571.1 | 2594.6 | 2597.3 | 2595.2 | 2583.1 | 2558.5 | 2512.5 | 2436.8 | 2321.8 |
| 17.5° | 2545.9 | 2554.7 | 2595.8 | 2640.7 | 2656.6 | 2658.2 | 2647.7 | 2613.3 | 2558.5 | 2477.4 | 2343.7 |
| 20°   | 2567.3 | 2579.3 | 2643.4 | 2707.0 | 2733.3 | 2733.3 | 2712.9 | 2664.8 | 2600.7 | 2514.1 | 2358.5 |
| 22.5° | 2622.0 | 2638.0 | 2718.4 | 2791.8 | 2819.8 | 2813.7 | 2786.4 | 2716.3 | 2644.5 | 2555.7 | 2377.1 |
| 25°   | 2730.0 | 2742.0 | 2825.8 | 2899.8 | 2916.8 | 2903.1 | 2868.6 | 2778.7 | 2700.4 | 2612.2 | 2411.1 |
| 27.5° | 2869.1 | 2870.8 | 2957.3 | 3019.8 | 3009.4 | 3000.0 | 2956.7 | 2857.1 | 2780.9 | 2692.7 | 2469.7 |
| 30°   | 3021.9 | 3021.9 | 3098.1 | 3145.7 | 3114.0 | 3106.3 | 3063.0 | 2951.8 | 2883.9 | 2802.3 | 2553.0 |
| 32.5° | 3169.9 | 3176.5 | 3238.3 | 3268.5 | 3232.9 | 3225.2 | 3183.0 | 3071.8 | 3020.9 | 2969.4 | 2682.9 |
| 35°   | 3312.9 | 3317.8 | 3376.4 | 3392.9 | 3358.9 | 3361.1 | 3330.9 | 3236.8 | 3217.6 | 3211.0 | 2878.4 |
| 37.5° | 3451.5 | 3452.6 | 3512.3 | 3522.7 | 3505.7 | 3524.3 | 3527.1 | 3443.8 | 3479.4 | 3532.5 | 3154.0 |
| 40°   | 3578.1 | 3579.1 | 3638.3 | 3665.2 | 3694.1 | 3718.3 | 3739.7 | 3695.3 | 3813.1 | 3936.3 | 3482.1 |
| 42.5° | 3679.4 | 3690.9 | 3766.0 | 3816.9 | 3893.6 | 3939.6 | 3997.7 | 3995.5 | 4210.2 | 4395.4 | 3878.8 |
| 45°   | 3768.7 | 3788.4 | 3893.0 | 3982.4 | 4113.8 | 4187.2 | 4278.2 | 4349.4 | 4657.3 | 4906.6 | 4280.4 |
| 47.5° | 3886.5 | 3905.1 | 4024.6 | 4170.8 | 4346.1 | 4442.6 | 4593.2 | 4747.2 | 5148.8 | 5408.4 | 4672.6 |
| 50°   | 4052.5 | 4044.2 | 4162.1 | 4371.8 | 4597.1 | 4723.6 | 4938.3 | 5169.0 | 5636.3 | 5845.6 | 4903.3 |
| 52.5° | 4229.4 | 4226.2 | 4313.3 | 4590.5 | 4892.9 | 5040.8 | 5324.6 | 5605.1 | 6102.6 | 6146.9 | 5009.0 |
| 55°   | 4448.6 | 4425.0 | 4498.4 | 4839.8 | 5244.1 | 5403.0 | 5737.1 | 6036.8 | 6474.0 | 6316.7 | 5062.2 |
| 57.5° | 4678.1 | 4639.2 | 4709.3 | 5117.5 | 5640.1 | 5828.0 | 6194.0 | 6457.6 | 6721.1 | 6432.9 | 5061.7 |
| 60°   | 4915.3 | 4869.3 | 4952.6 | 5464.8 | 6132.1 | 6349.6 | 6689.4 | 6741.9 | 6951.8 | 6491.5 | 5024.4 |
| 62.5° | 5113.6 | 5086.2 | 5210.1 | 5836.3 | 6681.6 | 6895.3 | 7063.5 | 7000.5 | 7146.2 | 6537.0 | 4937.3 |
| 65°   | 5323.5 | 5325.2 | 5525.1 | 6269.7 | 7265.6 | 7409.7 | 7424.0 | 7335.8 | 7308.9 | 6527.7 | 4642.6 |
| 67.5° | 5607.3 | 5633.6 | 5967.2 | 6858.1 | 7833.8 | 7945.0 | 7943.9 | 7699.0 | 7427.8 | 6157.3 | 3988.9 |
| 70°   | 5907.5 | 5969.5 | 6476.8 | 7531.4 | 8454.0 | 8566.8 | 8508.8 | 7930.2 | 6993.9 | 4978.9 | 2823.1 |
| 72.5° | 5857.1 | 5964.5 | 6760.0 | 7956.0 | 8899.4 | 8985.3 | 8607.9 | 7362.1 | 5527.9 | 2893.8 | 1202.0 |
| 75°   | 4518.8 | 4643.1 | 6198.4 | 7535.2 | 8432.0 | 8354.8 | 7396.0 | 5728.9 | 3020.9 | 807.6  | 270.6  |
| 77.5° | 2387.0 | 2453.3 | 4094.7 | 5740.4 | 6574.8 | 6413.1 | 5210.1 | 3178.1 | 920.9  | 200.0  | 121.7  |
| 80°   | 1250.2 | 1265.5 | 1784.4 | 3257.0 | 4057.9 | 4059.0 | 3087.7 | 1395.9 | 379.7  | 102.5  | 81.6   |
| 82.5° | 669.5  | 682.6  | 942.8  | 1504.9 | 2126.3 | 1927.4 | 1182.2 | 768.1  | 220.8  | 58.0   | 78.3   |
| 85°   | 161.1  | 163.8  | 534.7  | 687.6  | 836.1  | 597.1  | 351.2  | 644.8  | 59.7   | 34.0   | 63.5   |
| 87.5° | 61.9   | 63.0   | 198.3  | 297.4  | 213.1  | 138.1  | 164.3  | 240.5  | 7.6    | 13.1   | 9.9    |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

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CATALOG NUMBER: GLEON-SA3B-735-U-SL4-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 2425.9 | 2425.9 | 2425.9 | 2425.9 | 2425.9 | 2425.9 | 2425.9 | 2425.9 | 2425.9 | 2425.9 | 2425.9 |
| 2.5°  | 2401.8 | 2387.6 | 2352.5 | 2308.1 | 2268.7 | 2240.2 | 2197.4 | 2169.5 | 2150.9 | 2150.3 | 2143.2 |
| 5°    | 2341.0 | 2311.9 | 2236.4 | 2146.5 | 2064.9 | 1991.5 | 1904.9 | 1836.5 | 1785.5 | 1777.2 | 1759.7 |
| 7.5°  | 2275.8 | 2228.2 | 2112.0 | 1971.7 | 1834.8 | 1695.6 | 1534.0 | 1433.7 | 1347.8 | 1306.6 | 1302.2 |
| 10°   | 2235.8 | 2168.9 | 2004.0 | 1801.3 | 1586.6 | 1360.3 | 1148.9 | 1002.5 | 896.8  | 866.7  | 844.3  |
| 12.5° | 2227.6 | 2139.4 | 1920.8 | 1641.4 | 1334.5 | 1035.4 | 801.5  | 645.9  | 561.5  | 534.7  | 527.6  |
| 15°   | 2235.8 | 2125.7 | 1850.6 | 1483.0 | 1079.3 | 734.7  | 538.0  | 447.6  | 415.8  | 408.1  | 407.6  |
| 17.5° | 2240.7 | 2109.2 | 1771.2 | 1307.1 | 831.7  | 524.8  | 412.0  | 385.7  | 380.7  | 380.2  | 381.3  |
| 20°   | 2240.2 | 2084.1 | 1676.4 | 1111.1 | 618.5  | 412.5  | 372.5  | 367.0  | 366.0  | 366.5  | 366.0  |
| 22.5° | 2236.4 | 2054.4 | 1572.4 | 908.9  | 467.4  | 368.7  | 355.6  | 352.3  | 351.8  | 351.8  | 351.8  |
| 25°   | 2243.4 | 2030.9 | 1457.9 | 715.5  | 385.1  | 348.4  | 340.2  | 337.5  | 336.9  | 336.9  | 335.8  |
| 27.5° | 2269.2 | 2017.7 | 1332.4 | 550.6  | 347.9  | 330.3  | 323.8  | 323.2  | 321.6  | 321.0  | 322.1  |
| 30°   | 2310.9 | 2017.7 | 1194.9 | 428.4  | 325.4  | 311.7  | 306.8  | 305.7  | 305.2  | 304.6  | 305.2  |
| 32.5° | 2384.3 | 2033.1 | 1044.7 | 356.1  | 304.1  | 290.9  | 287.7  | 289.2  | 287.7  | 287.7  | 287.7  |
| 35°   | 2516.9 | 2079.1 | 887.5  | 310.7  | 281.6  | 270.6  | 267.4  | 269.6  | 268.5  | 268.5  | 267.9  |
| 37.5° | 2710.2 | 2164.5 | 729.2  | 283.3  | 261.9  | 250.4  | 246.0  | 249.3  | 248.2  | 248.2  | 247.6  |
| 40°   | 2945.8 | 2288.9 | 578.5  | 262.4  | 242.7  | 230.7  | 226.8  | 228.4  | 225.7  | 225.7  | 226.8  |
| 42.5° | 3236.8 | 2446.7 | 447.0  | 242.1  | 223.5  | 212.0  | 209.8  | 208.2  | 203.3  | 200.5  | 201.0  |
| 45°   | 3560.0 | 2611.0 | 348.4  | 222.5  | 205.4  | 196.1  | 192.8  | 188.5  | 180.3  | 174.8  | 175.3  |
| 47.5° | 3848.7 | 2737.6 | 283.3  | 203.3  | 189.0  | 181.9  | 177.0  | 168.7  | 156.7  | 150.1  | 150.6  |
| 50°   | 4000.4 | 2756.8 | 241.1  | 184.1  | 173.6  | 166.6  | 159.4  | 146.8  | 132.6  | 125.5  | 124.9  |
| 52.5° | 4039.4 | 2666.9 | 209.8  | 166.6  | 158.4  | 150.1  | 140.8  | 123.8  | 108.0  | 100.2  | 99.1   |
| 55°   | 4053.5 | 2530.0 | 181.9  | 150.1  | 141.9  | 132.6  | 120.5  | 101.4  | 86.5   | 78.9   | 78.3   |
| 57.5° | 4006.5 | 2325.6 | 159.9  | 135.4  | 125.5  | 113.9  | 99.1   | 81.0   | 66.8   | 60.8   | 60.8   |
| 60°   | 3901.8 | 2048.9 | 143.0  | 119.4  | 108.4  | 95.3   | 80.0   | 63.0   | 49.8   | 44.9   | 44.9   |
| 62.5° | 3693.1 | 1690.7 | 127.1  | 103.0  | 92.6   | 78.9   | 64.6   | 47.7   | 35.0   | 32.3   | 32.9   |
| 65°   | 3299.2 | 1282.6 | 111.2  | 88.2   | 78.9   | 65.2   | 50.4   | 34.0   | 23.6   | 23.6   | 24.7   |
| 67.5° | 2690.5 | 890.8  | 94.7   | 75.1   | 67.9   | 53.1   | 38.4   | 23.6   | 16.4   | 18.6   | 20.8   |
| 70°   | 1781.1 | 499.7  | 81.0   | 61.9   | 58.0   | 42.2   | 28.5   | 15.9   | 13.1   | 17.5   | 21.3   |
| 72.5° | 672.2  | 194.5  | 67.9   | 49.8   | 50.4   | 32.3   | 20.3   | 12.0   | 12.0   | 19.2   | 25.2   |
| 75°   | 187.3  | 95.3   | 48.7   | 36.7   | 39.4   | 23.6   | 14.8   | 10.4   | 11.6   | 21.9   | 29.6   |
| 77.5° | 110.1  | 70.1   | 31.8   | 21.3   | 26.8   | 16.4   | 9.9    | 8.2    | 9.9    | 18.6   | 28.5   |
| 80°   | 88.8   | 37.3   | 18.6   | 11.0   | 14.8   | 9.3    | 6.6    | 4.9    | 2.7    | 7.1    | 14.8   |
| 82.5° | 88.8   | 22.5   | 8.8    | 7.6    | 7.6    | 4.9    | 3.3    | 2.2    | 0.6    | 0.0    | 3.8    |
| 85°   | 59.7   | 9.3    | 5.5    | 4.9    | 3.8    | 1.7    | 1.1    | 0.6    | 0.0    | 0.0    | 0.0    |
| 87.5° | 9.9    | 3.8    | 2.2    | 1.1    | 0.6    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

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

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| 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 3500K 4-step quadrangle

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### 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              |           |                  |                  |

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### 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              |           |                  |                  |

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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)