

Signify Classified - Internal  
Cooper Lighting Solutions Photometric Lab  
1121 Highway 74 South  
Peachtree City, GA 30269



Scaled data based on original data using  
LM-79-08 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: P320067

Luminaire Tested: **GLEON-SA3A-760-U-SL4**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P320067  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-24)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA3A-760-U-SL4  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(3) 70 CRI, 5700K, 615mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE IV SPILL  
LIGHT ELIMINATOR OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 13519 lumens  
Efficiency: N/A  
Efficacy: 140.8 lumens/watt  
Luminous Opening: Rectangular (W 1' x L: 1' x H: 0')  
IES Classification: Type IV - Short  
BUG Rating: B2 - U0 - G4

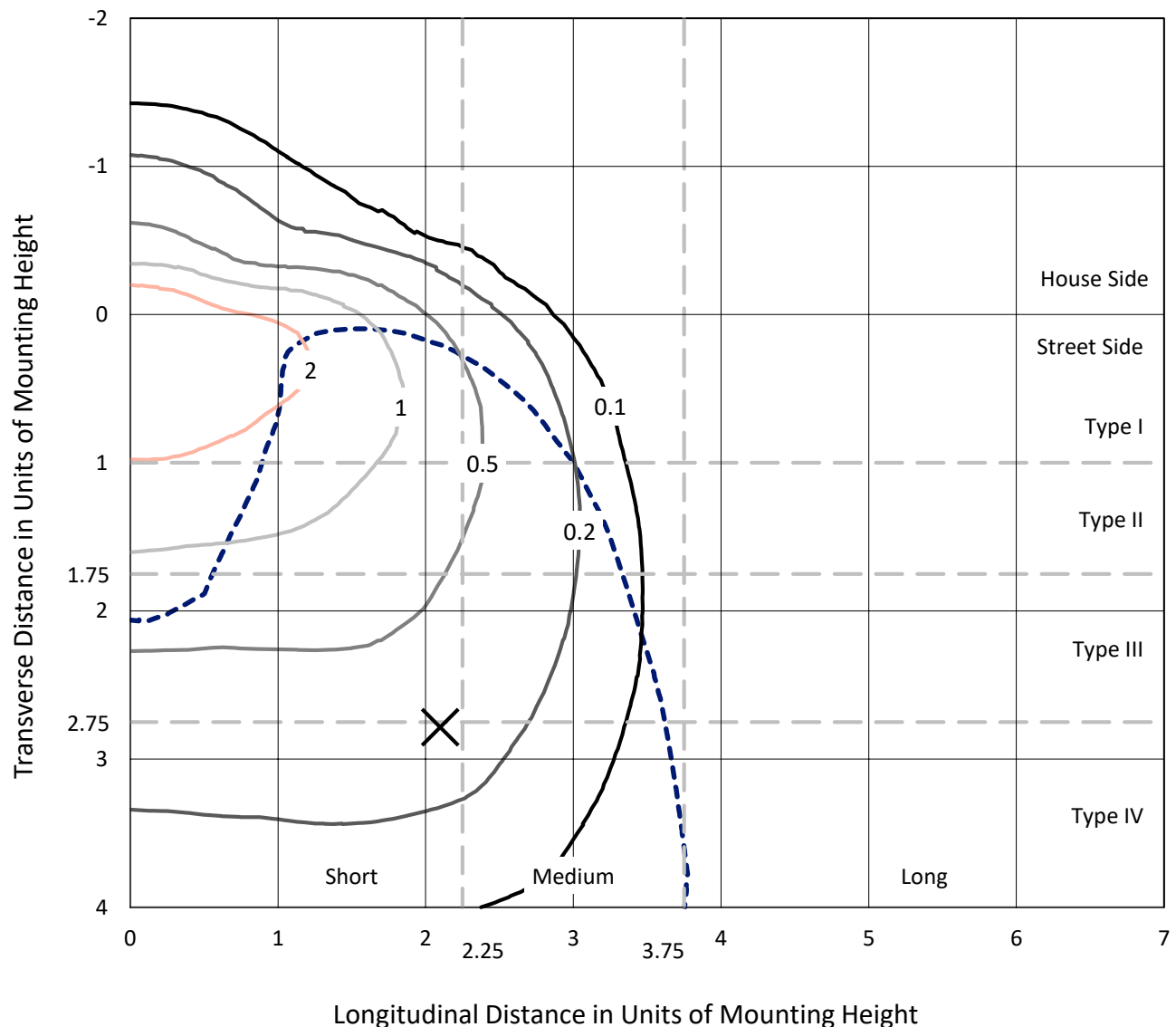
Input Watts (W): 96  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



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## Iso-Footcandle Lines of Horizontal Illumination

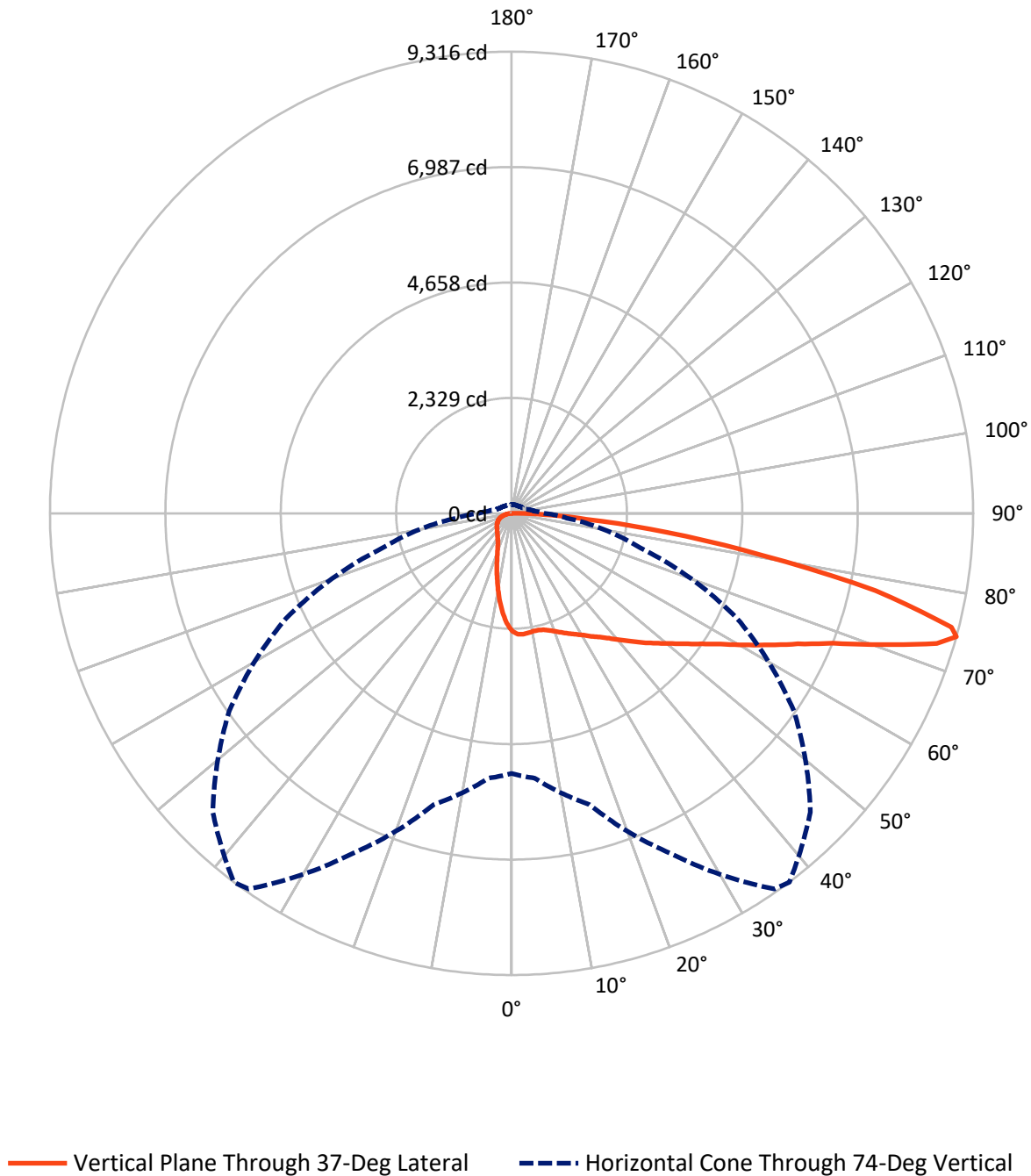
× Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 3.9 fc  
 Type IV - Short - N/A

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## Luminous Intensity Polar Plot



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CATALOG NUMBER: GLEON-SA3A-760-U-SL4

**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 1860.1   | 0.0    | 1860.1  |
|                    | % Fixture | 13.8     | 0.0    | 13.8    |
| <b>Street Side</b> | Lumens    | 11658.9  | 0.0    | 11658.9 |
|                    | % Fixture | 86.2     | 0.0    | 86.2    |
| <b>Total</b>       | Lumens    | 13519.0  | 0.0    | 13519.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 209.8   | 1.6       |
| 10°-20°   | 537.7   | 4.0       |
| 20°-30°   | 828.5   | 6.1       |
| 30°-40°   | 1204.7  | 8.9       |
| 40°-50°   | 1773.1  | 13.1      |
| 50°-60°   | 2490.0  | 18.4      |
| 60°-70°   | 3151.6  | 23.3      |
| 70°-80°   | 2775.1  | 20.5      |
| 80°-90°   | 548.7   | 4.1       |
| 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°    | 13519.0 | 100.0     |
| 0°-180°   | 13519.0 | 100.0     |

**Coefficient of Utilization**



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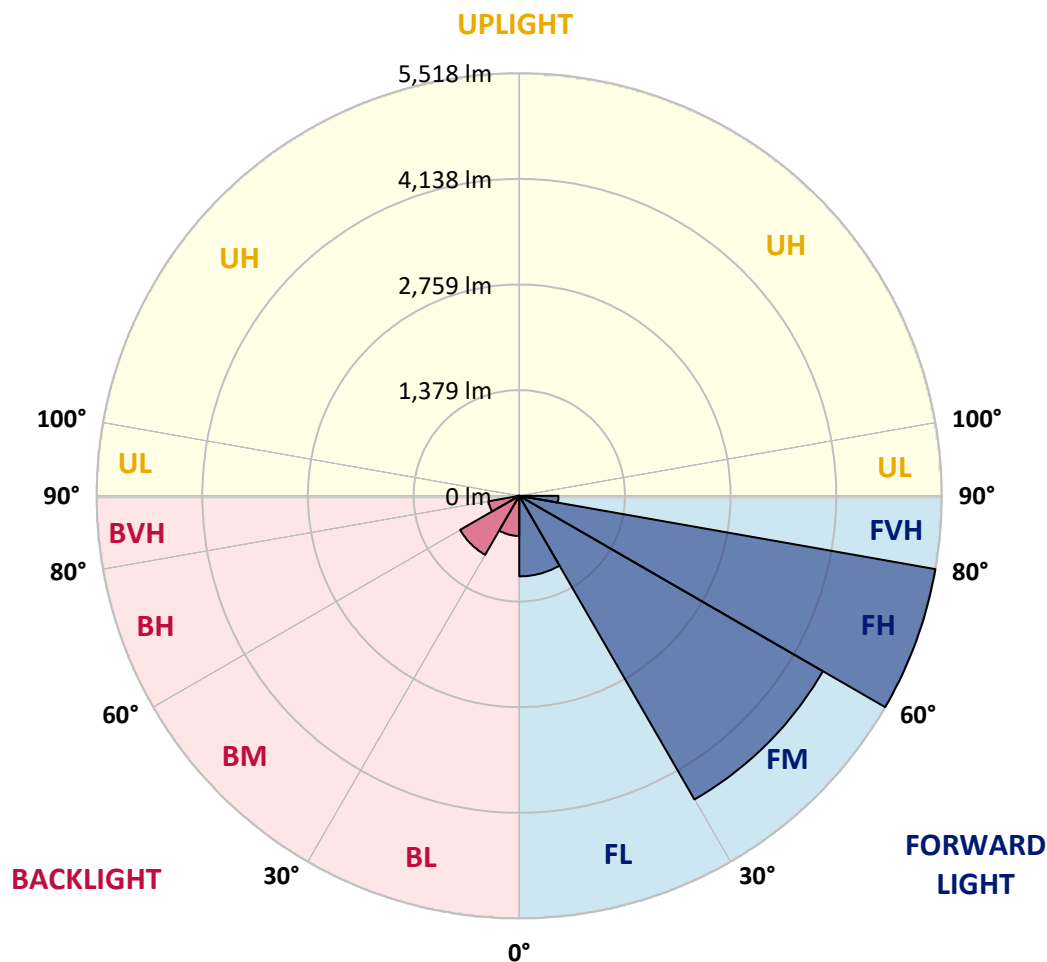
CATALOG NUMBER: GLEON-SA3A-760-U-SL4

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 1051.9 | 7.8       |                         |      |         |
| FM   | (30°-60°)   | 4577.6 | 33.9      |                         |      |         |
| FH   | (60°-80°)   | 5517.8 | 40.8      |                         |      | G3/7500 |
| FVH  | (80°-90°)   | 511.5  | 3.8       |                         |      | G4/750  |
| BL   | (0°-30°)    | 523.9  | 3.9       | B2/1000                 |      |         |
| BM   | (30°-60°)   | 890.1  | 6.6       | B1/1000                 |      |         |
| BH   | (60°-80°)   | 408.9  | 3.0       | B1/500                  |      | G1/500  |
| BVH  | (80°-90°)   | 37.2   | 0.3       |                         |      | G1/100  |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

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

Type IV Short





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CATALOG NUMBER: GLEON-SA3A-760-U-SL4

**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 37°    | 45°    | 55°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 2382.0 | 2382.0 | 2382.0 | 2382.0 | 2382.0 | 2382.0 | 2382.0 | 2382.0 | 2382.0 | 2382.0 | 2382.0 |
| 2.5°  | 2463.4 | 2463.9 | 2463.4 | 2459.6 | 2450.6 | 2443.0 | 2436.8 | 2427.7 | 2407.7 | 2392.5 | 2369.6 |
| 5°    | 2486.8 | 2483.9 | 2482.0 | 2474.9 | 2460.6 | 2452.0 | 2440.1 | 2422.9 | 2390.1 | 2359.6 | 2322.5 |
| 7.5°  | 2475.8 | 2472.5 | 2468.2 | 2459.6 | 2443.4 | 2436.3 | 2419.6 | 2397.2 | 2357.7 | 2317.7 | 2264.4 |
| 10°   | 2442.0 | 2441.0 | 2439.1 | 2437.2 | 2423.4 | 2417.7 | 2402.5 | 2378.7 | 2339.6 | 2291.0 | 2228.7 |
| 12.5° | 2404.4 | 2406.8 | 2414.4 | 2424.4 | 2418.2 | 2415.3 | 2405.8 | 2389.6 | 2349.6 | 2297.2 | 2222.0 |
| 15°   | 2380.6 | 2387.2 | 2407.7 | 2433.9 | 2439.1 | 2438.2 | 2435.8 | 2425.3 | 2382.9 | 2324.9 | 2237.2 |
| 17.5° | 2372.5 | 2383.4 | 2422.5 | 2465.8 | 2481.0 | 2484.4 | 2485.3 | 2467.2 | 2420.1 | 2358.7 | 2252.9 |
| 20°   | 2387.2 | 2401.0 | 2458.2 | 2517.7 | 2542.0 | 2543.9 | 2539.6 | 2508.2 | 2455.3 | 2387.7 | 2261.5 |
| 22.5° | 2432.0 | 2444.4 | 2515.8 | 2583.0 | 2610.6 | 2613.4 | 2600.6 | 2553.0 | 2492.5 | 2422.0 | 2273.4 |
| 25°   | 2518.2 | 2533.4 | 2604.9 | 2672.0 | 2686.3 | 2686.8 | 2668.2 | 2609.1 | 2541.0 | 2470.1 | 2299.1 |
| 27.5° | 2630.6 | 2645.8 | 2710.1 | 2775.8 | 2768.2 | 2763.9 | 2738.7 | 2679.6 | 2604.4 | 2536.3 | 2344.9 |
| 30°   | 2755.8 | 2772.5 | 2833.4 | 2880.1 | 2862.0 | 2853.4 | 2833.0 | 2756.8 | 2692.5 | 2626.8 | 2414.9 |
| 32.5° | 2885.3 | 2900.6 | 2953.9 | 2985.8 | 2963.0 | 2959.2 | 2928.2 | 2858.7 | 2807.2 | 2764.9 | 2528.2 |
| 35°   | 3018.2 | 3029.2 | 3081.5 | 3099.6 | 3069.2 | 3068.2 | 3059.6 | 2995.8 | 2963.4 | 2983.4 | 2693.0 |
| 37.5° | 3153.9 | 3156.8 | 3201.6 | 3202.5 | 3193.5 | 3197.3 | 3206.3 | 3166.3 | 3175.4 | 3237.7 | 2907.3 |
| 40°   | 3274.9 | 3282.5 | 3314.9 | 3324.9 | 3340.6 | 3353.9 | 3399.2 | 3373.0 | 3443.0 | 3553.5 | 3173.9 |
| 42.5° | 3364.4 | 3379.2 | 3431.1 | 3456.8 | 3507.8 | 3528.7 | 3592.5 | 3616.8 | 3757.8 | 3923.5 | 3491.1 |
| 45°   | 3440.1 | 3463.0 | 3546.3 | 3599.2 | 3685.4 | 3722.0 | 3813.5 | 3894.9 | 4113.5 | 4324.9 | 3824.9 |
| 47.5° | 3522.0 | 3551.1 | 3655.4 | 3756.3 | 3873.5 | 3914.9 | 4081.1 | 4203.0 | 4493.0 | 4728.8 | 4139.7 |
| 50°   | 3642.5 | 3664.9 | 3766.8 | 3925.4 | 4071.6 | 4124.9 | 4354.9 | 4529.7 | 4878.8 | 5113.5 | 4412.5 |
| 52.5° | 3810.6 | 3802.0 | 3888.2 | 4110.6 | 4306.8 | 4372.5 | 4647.3 | 4877.3 | 5269.7 | 5461.6 | 4643.0 |
| 55°   | 3979.7 | 3965.4 | 4025.9 | 4304.4 | 4581.1 | 4650.2 | 4969.2 | 5226.4 | 5641.6 | 5775.0 | 4819.7 |
| 57.5° | 4167.8 | 4140.6 | 4191.6 | 4523.0 | 4893.5 | 4975.9 | 5329.7 | 5597.4 | 6007.4 | 6028.3 | 4932.1 |
| 60°   | 4361.6 | 4324.9 | 4382.1 | 4794.0 | 5290.2 | 5387.3 | 5751.6 | 5959.3 | 6352.1 | 6231.2 | 4968.3 |
| 62.5° | 4531.1 | 4505.4 | 4593.5 | 5096.4 | 5737.4 | 5844.0 | 6165.9 | 6344.1 | 6692.2 | 6315.5 | 4837.8 |
| 65°   | 4679.2 | 4683.5 | 4835.9 | 5436.4 | 6236.0 | 6349.8 | 6641.2 | 6818.4 | 6959.8 | 6265.5 | 4532.6 |
| 67.5° | 4855.9 | 4880.2 | 5140.2 | 5884.0 | 6863.6 | 6988.4 | 7332.7 | 7335.5 | 7109.3 | 5972.1 | 3931.6 |
| 70°   | 5113.5 | 5163.5 | 5558.8 | 6505.0 | 7756.0 | 7927.4 | 8193.2 | 7639.3 | 6899.3 | 5176.9 | 3093.5 |
| 72.5° | 5342.1 | 5435.4 | 6004.0 | 7215.5 | 8843.7 | 8973.7 | 8696.5 | 7464.1 | 6021.7 | 3879.7 | 1927.2 |
| 74°   | 5249.2 | 5365.0 | 6085.0 | 7565.5 | 9253.2 | 9315.6 | 8526.5 | 6952.6 | 5020.7 | 2686.8 | 1120.0 |
| 75°   | 5049.2 | 5175.0 | 5966.9 | 7562.2 | 9201.3 | 9166.5 | 8116.0 | 6368.3 | 4134.9 | 1832.5 | 745.3  |
| 77.5° | 4074.9 | 4207.8 | 5027.8 | 6481.2 | 7544.6 | 7511.7 | 6234.5 | 4272.1 | 1811.0 | 601.0  | 378.6  |
| 80°   | 2369.1 | 2470.6 | 3121.1 | 4115.9 | 5087.3 | 5146.9 | 4100.2 | 2113.9 | 712.4  | 337.6  | 256.7  |
| 82.5° | 1052.4 | 1122.4 | 1507.7 | 2101.0 | 3070.1 | 3146.8 | 2147.2 | 1107.7 | 440.0  | 205.2  | 154.3  |
| 85°   | 690.5  | 742.4  | 915.3  | 1000.5 | 1462.0 | 1514.3 | 1051.0 | 862.4  | 290.5  | 112.9  | 113.3  |
| 87.5° | 496.7  | 546.7  | 680.0  | 593.8  | 671.0  | 635.3  | 571.9  | 798.1  | 116.7  | 64.3   | 38.1   |
| 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-SA3A-760-U-SL4

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 2382.0 | 2382.0 | 2382.0 | 2382.0 | 2382.0 | 2382.0 | 2382.0 | 2382.0 | 2382.0 | 2382.0 | 2382.0 |
| 2.5°  | 2359.6 | 2352.0 | 2334.9 | 2302.5 | 2284.4 | 2269.1 | 2243.9 | 2229.1 | 2222.5 | 2222.0 | 2224.8 |
| 5°    | 2301.0 | 2283.4 | 2239.1 | 2184.8 | 2141.5 | 2102.0 | 2052.9 | 2023.4 | 2002.5 | 1990.1 | 1993.4 |
| 7.5°  | 2232.9 | 2205.3 | 2135.8 | 2049.1 | 1979.6 | 1902.9 | 1827.2 | 1782.0 | 1746.7 | 1720.5 | 1725.3 |
| 10°   | 2186.3 | 2148.2 | 2046.7 | 1922.0 | 1806.3 | 1694.8 | 1590.5 | 1528.2 | 1478.6 | 1440.5 | 1443.4 |
| 12.5° | 2170.6 | 2119.1 | 1978.6 | 1812.0 | 1649.6 | 1497.2 | 1361.0 | 1265.3 | 1214.3 | 1171.0 | 1174.3 |
| 15°   | 2172.9 | 2103.9 | 1921.5 | 1712.9 | 1508.6 | 1316.7 | 1151.5 | 1039.6 | 970.5  | 940.5  | 941.0  |
| 17.5° | 2174.8 | 2086.3 | 1861.5 | 1606.7 | 1369.1 | 1148.1 | 968.6  | 855.3  | 790.0  | 762.4  | 762.9  |
| 20°   | 2168.7 | 2057.7 | 1787.2 | 1484.8 | 1223.4 | 993.4  | 819.6  | 723.4  | 673.8  | 652.4  | 652.4  |
| 22.5° | 2160.6 | 2023.9 | 1703.4 | 1362.4 | 1079.6 | 859.1  | 712.9  | 639.5  | 611.0  | 596.7  | 596.2  |
| 25°   | 2164.4 | 1998.6 | 1617.7 | 1236.7 | 947.2  | 751.9  | 641.9  | 593.4  | 574.3  | 565.3  | 564.8  |
| 27.5° | 2184.8 | 1986.7 | 1538.6 | 1111.5 | 831.5  | 671.5  | 594.3  | 560.0  | 547.6  | 541.9  | 541.9  |
| 30°   | 2222.0 | 1986.7 | 1456.2 | 1004.8 | 735.3  | 611.9  | 557.6  | 534.3  | 525.7  | 521.9  | 521.9  |
| 32.5° | 2286.8 | 1997.7 | 1376.7 | 899.1  | 658.6  | 565.3  | 527.2  | 511.4  | 504.8  | 502.9  | 502.9  |
| 35°   | 2398.2 | 2034.8 | 1299.1 | 799.1  | 596.7  | 527.2  | 498.1  | 489.1  | 484.3  | 483.8  | 485.3  |
| 37.5° | 2554.9 | 2110.6 | 1226.2 | 725.3  | 552.9  | 496.2  | 473.8  | 466.7  | 463.8  | 466.2  | 468.1  |
| 40°   | 2752.0 | 2213.4 | 1160.0 | 658.6  | 519.5  | 471.4  | 451.4  | 446.7  | 445.3  | 448.6  | 451.4  |
| 42.5° | 2990.1 | 2352.5 | 1105.8 | 610.5  | 493.8  | 450.5  | 432.4  | 426.7  | 425.3  | 429.1  | 432.9  |
| 45°   | 3247.7 | 2502.0 | 1067.7 | 574.8  | 473.8  | 434.8  | 415.7  | 409.5  | 406.7  | 408.6  | 412.9  |
| 47.5° | 3482.0 | 2643.4 | 1052.4 | 549.5  | 454.8  | 421.4  | 401.0  | 393.3  | 388.6  | 387.6  | 391.0  |
| 50°   | 3679.7 | 2748.7 | 1059.6 | 534.3  | 439.5  | 406.7  | 386.7  | 378.1  | 371.0  | 366.7  | 369.1  |
| 52.5° | 3823.5 | 2814.9 | 1066.2 | 527.6  | 427.6  | 390.5  | 371.0  | 362.9  | 353.3  | 346.2  | 346.2  |
| 55°   | 3927.8 | 2830.1 | 1051.5 | 522.4  | 418.6  | 372.9  | 353.3  | 345.7  | 336.2  | 328.1  | 327.2  |
| 57.5° | 3968.7 | 2787.2 | 996.7  | 514.8  | 412.4  | 356.2  | 334.8  | 329.1  | 321.0  | 311.4  | 311.0  |
| 60°   | 3913.5 | 2654.9 | 891.0  | 498.6  | 404.3  | 342.4  | 316.2  | 312.4  | 308.6  | 299.5  | 299.1  |
| 62.5° | 3691.6 | 2364.4 | 754.3  | 465.7  | 388.1  | 327.6  | 299.1  | 301.0  | 301.4  | 295.2  | 294.3  |
| 65°   | 3289.2 | 1965.3 | 621.0  | 422.9  | 363.8  | 310.0  | 281.4  | 290.5  | 295.7  | 294.8  | 293.3  |
| 67.5° | 2704.4 | 1529.6 | 526.2  | 377.6  | 331.9  | 285.7  | 262.4  | 272.9  | 277.2  | 280.5  | 279.5  |
| 70°   | 2007.2 | 1078.6 | 435.3  | 330.0  | 293.3  | 257.2  | 237.6  | 242.9  | 240.0  | 243.8  | 245.2  |
| 72.5° | 1119.1 | 647.2  | 354.8  | 282.4  | 253.3  | 223.8  | 210.0  | 209.1  | 202.9  | 202.9  | 202.9  |
| 74°   | 671.5  | 474.8  | 311.9  | 252.9  | 229.1  | 201.9  | 190.0  | 185.7  | 180.0  | 180.5  | 180.0  |
| 75°   | 540.0  | 408.1  | 286.2  | 233.3  | 211.9  | 189.1  | 177.1  | 171.4  | 167.1  | 167.1  | 166.7  |
| 77.5° | 341.0  | 310.0  | 230.5  | 185.7  | 169.5  | 155.7  | 147.6  | 140.0  | 140.0  | 139.5  | 139.1  |
| 80°   | 257.6  | 246.7  | 179.5  | 140.5  | 130.0  | 119.5  | 114.3  | 111.0  | 111.0  | 112.4  | 111.9  |
| 82.5° | 176.7  | 185.7  | 126.2  | 98.1   | 92.9   | 85.2   | 84.3   | 84.8   | 83.3   | 81.4   | 81.0   |
| 85°   | 129.1  | 139.5  | 85.2   | 61.9   | 56.7   | 51.9   | 55.7   | 57.6   | 55.2   | 51.0   | 49.0   |
| 87.5° | 49.5   | 91.4   | 45.7   | 25.7   | 23.8   | 20.5   | 23.8   | 24.8   | 26.7   | 21.0   | 21.4   |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

LM-79-2008: Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Report Prepared for

Cooper Lighting Solutions

McGRAW-EDISON

Report Number: SP1-1908-441-9-R4

Test Date: 10/23/2019

Luminaire Tested: SA1C-760-U-5WQ

Data in this report applies to families of products SA1C-760-U-5WQ .

### Test Information

Test Method: LM-79-2008  
 Report Number: SP1-1908-441-9-R4  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry:  $4\pi$   
 Issue Date: 10/28/2024  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: MCGRAW-EDISON  
 Catalog Number: **SA1C-760-U-5WQ**  
 Description: MCGRAW EDISON ROADWAY AND AREA LUMINAIRE

\*\*\*THIS IS A REVISION OF SP1-1908-441-4-R3. TO UPDATE THE CATALOG INFORMATION.\*\*\*TESTED IN SITU. ROADWAY AND AREA LUMINAIRE. (1) 70 CRI, 5000K, 1050MA LIGHTSQUARE WITH 16 LEDS AND TYPE V WIDE OPTICS.

### Spectral Parameters

|                           |        |           |      |      |       |
|---------------------------|--------|-----------|------|------|-------|
| CCT (K):                  | 5474   | CRI (Ra): | 71.7 |      |       |
| CIE u':                   | 0.2052 | R1:       | 70.6 | R9:  | -27.1 |
| CIE v':                   | 0.4804 | R2:       | 74.6 | R10: | 40.8  |
| Duv:                      | 0.0025 | R3:       | 78.3 | R11: | 74.6  |
| CIE x:                    | 0.3330 | R4:       | 73.8 | R12: | 50.4  |
| CIE y:                    | 0.3466 | R5:       | 72.4 | R13: | 70.0  |
| CIE z:                    | 0.3204 | R6:       | 67.5 | R14: | 87.8  |
| Peak Wavelength (nm):     | 442    | R7:       | 77.5 |      |       |
| Dominant Wavelength (nm): | 554    | R8:       | 58.9 |      |       |
| Purity:                   | 4.1    |           |      |      |       |
| Rf:                       | 72.1   |           |      |      |       |
| Rg:                       | 97.2   |           |      |      |       |



### Test Conditions

Stabilization Time: 240M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 24.6/31%  
 Sphere Temperature (°C): 25.9

REPORT NUMBER: SP1-1908-441-9-R4

| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | IN0058                | 6/28/2019        | 12/28/2019           |
| Power Meter                    | IN0071                | 12/5/2018        | 12/5/2019            |
| AC Power Source                | IN0063                | 12/5/2018        | 12/5/2019            |
| DC Power Source                | IN0208                | 12/5/2018        | 12/5/2019            |
| Sphere Thermometer             | IN0085                | 12/5/2018        | 12/5/2019            |
| Room Thermometer               | IN0046                | 12/5/2018        | 12/5/2019            |

REPORT NUMBER: SP1-1908-441-9-R4

CIE 1931 Chromaticity Diagram



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



Point lies inside the ANSI 5700K 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       | 3540             | NR               | 490       | 33363            | NR               | 620       | 80193            | NR               | 750       | 4663             | NR               | 880       | 4678             | NR               |
| 365       | 2862             | NR               | 495       | 44177            | NR               | 625       | 73091            | NR               | 755       | 4147             | NR               | 885       | 4128             | NR               |
| 370       | 2865             | NR               | 500       | 57019            | NR               | 630       | 66269            | NR               | 760       | 4040             | NR               | 890       | 4504             | NR               |
| 375       | 3254             | NR               | 505       | 70030            | NR               | 635       | 60012            | NR               | 765       | 3474             | NR               | 895       | 4371             | NR               |
| 380       | 3076             | NR               | 510       | 81972            | NR               | 640       | 53914            | NR               | 770       | 3469             | NR               | 900       | 4082             | NR               |
| 385       | 2904             | NR               | 515       | 92590            | NR               | 645       | 48385            | NR               | 775       | 3181             | NR               | 905       | 2982             | NR               |
| 390       | 2689             | NR               | 520       | 100305           | NR               | 650       | 43219            | NR               | 780       | 2969             | NR               | 910       | 4351             | NR               |
| 395       | 2619             | NR               | 525       | 107452           | NR               | 655       | 38562            | NR               | 785       | 3132             | NR               | 915       | 3365             | NR               |
| 400       | 2679             | NR               | 530       | 111373           | NR               | 660       | 34110            | NR               | 790       | 2507             | NR               | 920       | 3430             | NR               |
| 405       | 3515             | NR               | 535       | 114505           | NR               | 665       | 30085            | NR               | 795       | 2968             | NR               | 925       | 4264             | NR               |
| 410       | 6934             | NR               | 540       | 116408           | NR               | 670       | 26205            | NR               | 800       | 2758             | NR               | 930       | 4095             | NR               |
| 415       | 14943            | NR               | 545       | 118700           | NR               | 675       | 22906            | NR               | 805       | 2872             | NR               | 935       | 5048             | NR               |
| 420       | 31939            | NR               | 550       | 119209           | NR               | 680       | 20058            | NR               | 810       | 3094             | NR               | 940       | 4074             | NR               |
| 425       | 64701            | NR               | 555       | 120742           | NR               | 685       | 17413            | NR               | 815       | 3222             | NR               | 945       | 4949             | NR               |
| 430       | 110939           | NR               | 560       | 121594           | NR               | 690       | 15447            | NR               | 820       | 3238             | NR               | 950       | 4387             | NR               |
| 435       | 164597           | NR               | 565       | 121913           | NR               | 695       | 13398            | NR               | 825       | 3524             | NR               | 955       | 4978             | NR               |
| 440       | 207696           | NR               | 570       | 122147           | NR               | 700       | 11777            | NR               | 830       | 2921             | NR               | 960       | 4706             | NR               |
| 445       | 201830           | NR               | 575       | 121605           | NR               | 705       | 10412            | NR               | 835       | 3595             | NR               | 965       | 5083             | NR               |
| 450       | 145410           | NR               | 580       | 120248           | NR               | 710       | 9544             | NR               | 840       | 3016             | NR               | 970       | 4522             | NR               |
| 455       | 89594            | NR               | 585       | 117717           | NR               | 715       | 8940             | NR               | 845       | 4032             | NR               | 975       | 4740             | NR               |
| 460       | 58321            | NR               | 590       | 114359           | NR               | 720       | 7897             | NR               | 850       | 3579             | NR               | 980       | 6122             | NR               |
| 465       | 39318            | NR               | 595       | 109974           | NR               | 725       | 7045             | NR               | 855       | 4571             | NR               | 985       | 6450             | NR               |
| 470       | 27693            | NR               | 600       | 105269           | NR               | 730       | 6483             | NR               | 860       | 4485             | NR               | 990       | 4875             | NR               |
| 475       | 23081            | NR               | 605       | 99453            | NR               | 735       | 5838             | NR               | 865       | 3978             | NR               | 995       | 4764             | NR               |
| 480       | 23002            | NR               | 610       | 92921            | NR               | 740       | 5261             | NR               | 870       | 4298             | NR               | 1000      | 3640             | NR               |
| 485       | 26201            | NR               | 615       | 86989            | NR               | 745       | 4760             | NR               | 875       | 4356             | NR               |           |                  |                  |

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**Scotopic Flux vs. Wavelength**



**Scotopic Lumens: 13759.3**

**S/P: 1.85**

| 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       | 3540             | NR               | 490       | 33363            | NR               | 620       | 80193            | NR               | 750       | 4663             | NR               | 880       | 4678             | NR               |
| 365       | 2862             | NR               | 495       | 44177            | NR               | 625       | 73091            | NR               | 755       | 4147             | NR               | 885       | 4128             | NR               |
| 370       | 2865             | NR               | 500       | 57019            | NR               | 630       | 66269            | NR               | 760       | 4040             | NR               | 890       | 4504             | NR               |
| 375       | 3254             | NR               | 505       | 70030            | NR               | 635       | 60012            | NR               | 765       | 3474             | NR               | 895       | 4371             | NR               |
| 380       | 3076             | NR               | 510       | 81972            | NR               | 640       | 53914            | NR               | 770       | 3469             | NR               | 900       | 4082             | NR               |
| 385       | 2904             | NR               | 515       | 92590            | NR               | 645       | 48385            | NR               | 775       | 3181             | NR               | 905       | 2982             | NR               |
| 390       | 2689             | NR               | 520       | 100305           | NR               | 650       | 43219            | NR               | 780       | 2969             | NR               | 910       | 4351             | NR               |
| 395       | 2619             | NR               | 525       | 107452           | NR               | 655       | 38562            | NR               | 785       | 3132             | NR               | 915       | 3365             | NR               |
| 400       | 2679             | NR               | 530       | 111373           | NR               | 660       | 34110            | NR               | 790       | 2507             | NR               | 920       | 3430             | NR               |
| 405       | 3515             | NR               | 535       | 114505           | NR               | 665       | 30085            | NR               | 795       | 2968             | NR               | 925       | 4264             | NR               |
| 410       | 6934             | NR               | 540       | 116408           | NR               | 670       | 26205            | NR               | 800       | 2758             | NR               | 930       | 4095             | NR               |
| 415       | 14943            | NR               | 545       | 118700           | NR               | 675       | 22906            | NR               | 805       | 2872             | NR               | 935       | 5048             | NR               |
| 420       | 31939            | NR               | 550       | 119209           | NR               | 680       | 20058            | NR               | 810       | 3094             | NR               | 940       | 4074             | NR               |
| 425       | 64701            | NR               | 555       | 120742           | NR               | 685       | 17413            | NR               | 815       | 3222             | NR               | 945       | 4949             | NR               |
| 430       | 110939           | NR               | 560       | 121594           | NR               | 690       | 15447            | NR               | 820       | 3238             | NR               | 950       | 4387             | NR               |
| 435       | 164597           | NR               | 565       | 121913           | NR               | 695       | 13398            | NR               | 825       | 3524             | NR               | 955       | 4978             | NR               |
| 440       | 207696           | NR               | 570       | 122147           | NR               | 700       | 11777            | NR               | 830       | 2921             | NR               | 960       | 4706             | NR               |
| 445       | 201830           | NR               | 575       | 121605           | NR               | 705       | 10412            | NR               | 835       | 3595             | NR               | 965       | 5083             | NR               |
| 450       | 145410           | NR               | 580       | 120248           | NR               | 710       | 9544             | NR               | 840       | 3016             | NR               | 970       | 4522             | NR               |
| 455       | 89594            | NR               | 585       | 117717           | NR               | 715       | 8940             | NR               | 845       | 4032             | NR               | 975       | 4740             | NR               |
| 460       | 58321            | NR               | 590       | 114359           | NR               | 720       | 7897             | NR               | 850       | 3579             | NR               | 980       | 6122             | NR               |
| 465       | 39318            | NR               | 595       | 109974           | NR               | 725       | 7045             | NR               | 855       | 4571             | NR               | 985       | 6450             | NR               |
| 470       | 27693            | NR               | 600       | 105269           | NR               | 730       | 6483             | NR               | 860       | 4485             | NR               | 990       | 4875             | NR               |
| 475       | 23081            | NR               | 605       | 99453            | NR               | 735       | 5838             | NR               | 865       | 3978             | NR               | 995       | 4764             | NR               |
| 480       | 23002            | NR               | 610       | 92921            | NR               | 740       | 5261             | NR               | 870       | 4298             | NR               | 1000      | 3640             | NR               |
| 485       | 26201            | NR               | 615       | 86989            | NR               | 745       | 4760             | NR               | 875       | 4356             | NR               |           |                  |                  |

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**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: 5527.6 M/P: 0.74**

| 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       | 3540             | NR               | 490       | 33363            | NR               | 620       | 80193            | NR               | 750       | 4663             | NR               | 880       | 4678             | NR               |
| 365       | 2862             | NR               | 495       | 44177            | NR               | 625       | 73091            | NR               | 755       | 4147             | NR               | 885       | 4128             | NR               |
| 370       | 2865             | NR               | 500       | 57019            | NR               | 630       | 66269            | NR               | 760       | 4040             | NR               | 890       | 4504             | NR               |
| 375       | 3254             | NR               | 505       | 70030            | NR               | 635       | 60012            | NR               | 765       | 3474             | NR               | 895       | 4371             | NR               |
| 380       | 3076             | NR               | 510       | 81972            | NR               | 640       | 53914            | NR               | 770       | 3469             | NR               | 900       | 4082             | NR               |
| 385       | 2904             | NR               | 515       | 92590            | NR               | 645       | 48385            | NR               | 775       | 3181             | NR               | 905       | 2982             | NR               |
| 390       | 2689             | NR               | 520       | 100305           | NR               | 650       | 43219            | NR               | 780       | 2969             | NR               | 910       | 4351             | NR               |
| 395       | 2619             | NR               | 525       | 107452           | NR               | 655       | 38562            | NR               | 785       | 3132             | NR               | 915       | 3365             | NR               |
| 400       | 2679             | NR               | 530       | 111373           | NR               | 660       | 34110            | NR               | 790       | 2507             | NR               | 920       | 3430             | NR               |
| 405       | 3515             | NR               | 535       | 114505           | NR               | 665       | 30085            | NR               | 795       | 2968             | NR               | 925       | 4264             | NR               |
| 410       | 6934             | NR               | 540       | 116408           | NR               | 670       | 26205            | NR               | 800       | 2758             | NR               | 930       | 4095             | NR               |
| 415       | 14943            | NR               | 545       | 118700           | NR               | 675       | 22906            | NR               | 805       | 2872             | NR               | 935       | 5048             | NR               |
| 420       | 31939            | NR               | 550       | 119209           | NR               | 680       | 20058            | NR               | 810       | 3094             | NR               | 940       | 4074             | NR               |
| 425       | 64701            | NR               | 555       | 120742           | NR               | 685       | 17413            | NR               | 815       | 3222             | NR               | 945       | 4949             | NR               |
| 430       | 110939           | NR               | 560       | 121594           | NR               | 690       | 15447            | NR               | 820       | 3238             | NR               | 950       | 4387             | NR               |
| 435       | 164597           | NR               | 565       | 121913           | NR               | 695       | 13398            | NR               | 825       | 3524             | NR               | 955       | 4978             | NR               |
| 440       | 207696           | NR               | 570       | 122147           | NR               | 700       | 11777            | NR               | 830       | 2921             | NR               | 960       | 4706             | NR               |
| 445       | 201830           | NR               | 575       | 121605           | NR               | 705       | 10412            | NR               | 835       | 3595             | NR               | 965       | 5083             | NR               |
| 450       | 145410           | NR               | 580       | 120248           | NR               | 710       | 9544             | NR               | 840       | 3016             | NR               | 970       | 4522             | NR               |
| 455       | 89594            | NR               | 585       | 117717           | NR               | 715       | 8940             | NR               | 845       | 4032             | NR               | 975       | 4740             | NR               |
| 460       | 58321            | NR               | 590       | 114359           | NR               | 720       | 7897             | NR               | 850       | 3579             | NR               | 980       | 6122             | NR               |
| 465       | 39318            | NR               | 595       | 109974           | NR               | 725       | 7045             | NR               | 855       | 4571             | NR               | 985       | 6450             | NR               |
| 470       | 27693            | NR               | 600       | 105269           | NR               | 730       | 6483             | NR               | 860       | 4485             | NR               | 990       | 4875             | NR               |
| 475       | 23081            | NR               | 605       | 99453            | NR               | 735       | 5838             | NR               | 865       | 3978             | NR               | 995       | 4764             | NR               |
| 480       | 23002            | NR               | 610       | 92921            | NR               | 740       | 5261             | NR               | 870       | 4298             | NR               | 1000      | 3640             | NR               |
| 485       | 26201            | NR               | 615       | 86989            | NR               | 745       | 4760             | NR               | 875       | 4356             | NR               |           |                  |                  |

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**Summary**

$R_f = 72.1$   
 $R_g = 97.2$   
 CIE  $R_a = 71.7$   
 $R_g = -27.1$



**Color Vector Graphics**



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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 54 | CES51 = 88 | CES76 = 43 |
| CES02 = 59 | CES27 = 79 | CES52 = 90 | CES77 = 64 |
| CES03 = 30 | CES28 = 77 | CES53 = 77 | CES78 = 46 |
| CES04 = 69 | CES29 = 50 | CES54 = 81 | CES79 = 74 |
| CES05 = 46 | CES30 = 59 | CES55 = 80 | CES80 = 70 |
| CES06 = 50 | CES31 = 55 | CES56 = 70 | CES81 = 71 |
| CES07 = 38 | CES32 = 52 | CES57 = 68 | CES82 = 88 |
| CES08 = 38 | CES33 = 63 | CES58 = 70 | CES83 = 82 |
| CES09 = 29 | CES34 = 63 | CES59 = 88 | CES84 = 87 |
| CES10 = 72 | CES35 = 79 | CES60 = 92 | CES85 = 84 |
| CES11 = 55 | CES36 = 90 | CES61 = 88 | CES86 = 76 |
| CES12 = 61 | CES37 = 72 | CES62 = 81 | CES87 = 75 |
| CES13 = 41 | CES38 = 68 | CES63 = 75 | CES88 = 77 |
| CES14 = 74 | CES39 = 91 | CES64 = 72 | CES89 = 76 |
| CES15 = 70 | CES40 = 83 | CES65 = 65 | CES90 = 76 |
| CES16 = 46 | CES41 = 84 | CES66 = 66 | CES91 = 92 |
| CES17 = 48 | CES42 = 70 | CES67 = 64 | CES92 = 70 |
| CES18 = 55 | CES43 = 69 | CES68 = 71 | CES93 = 83 |
| CES19 = 70 | CES44 = 98 | CES69 = 80 | CES94 = 60 |
| CES20 = 64 | CES45 = 79 | CES70 = 58 | CES95 = 73 |
| CES21 = 85 | CES46 = 78 | CES71 = 55 | CES96 = 79 |
| CES22 = 77 | CES47 = 76 | CES72 = 84 | CES97 = 84 |
| CES23 = 91 | CES48 = 68 | CES73 = 47 | CES98 = 73 |
| CES24 = 90 | CES49 = 78 | CES74 = 94 | CES99 = 62 |
| CES25 = 71 | CES50 = 87 | CES75 = 51 |            |



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Color Rendition by Hue-Angle Bin



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**Measure Comparisons**



(END OF REPORT)