

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: P319438

Luminaire Tested: **GLEON-SA4B-760-U-SL2**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P319438  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-20)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA4B-760-U-SL2  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(4) 70 CRI, 5700K, 800mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE II SPILL  
LIGHT ELIMINATOR OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 22583 lumens  
Efficiency: N/A  
Efficacy: 132.1 lumens/watt  
Luminous Opening: Rectangular (W 1' x L: 1' x H: 0')  
IES Classification: Type III - Medium  
BUG Rating: B3 - U0 - G4

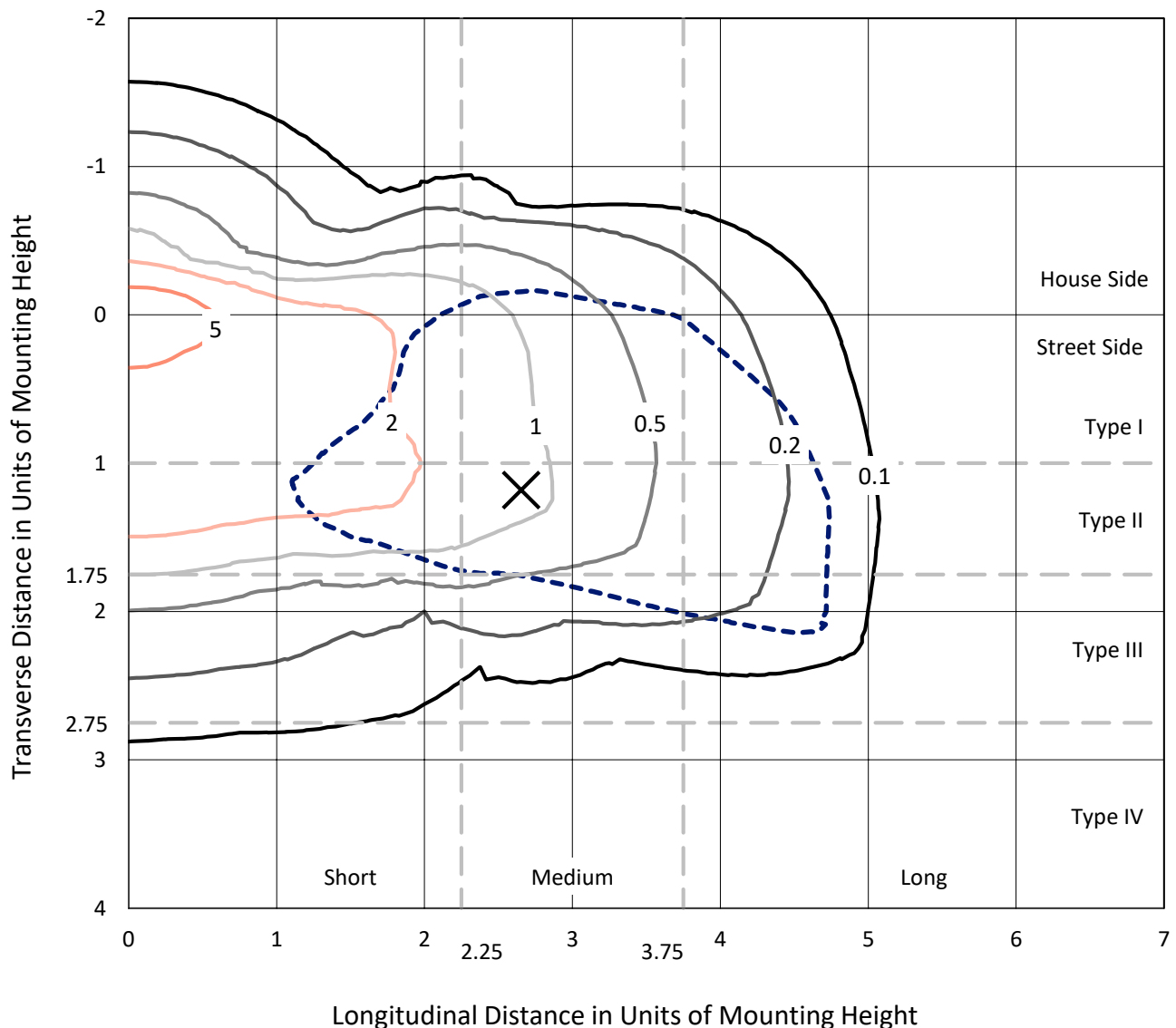
Input Watts (W): 171  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



REPORT NUMBER: P319438  
 CATALOG NUMBER: GLEON-SA4B-760-U-SL2

## Iso-Footcandle Lines of Horizontal Illumination

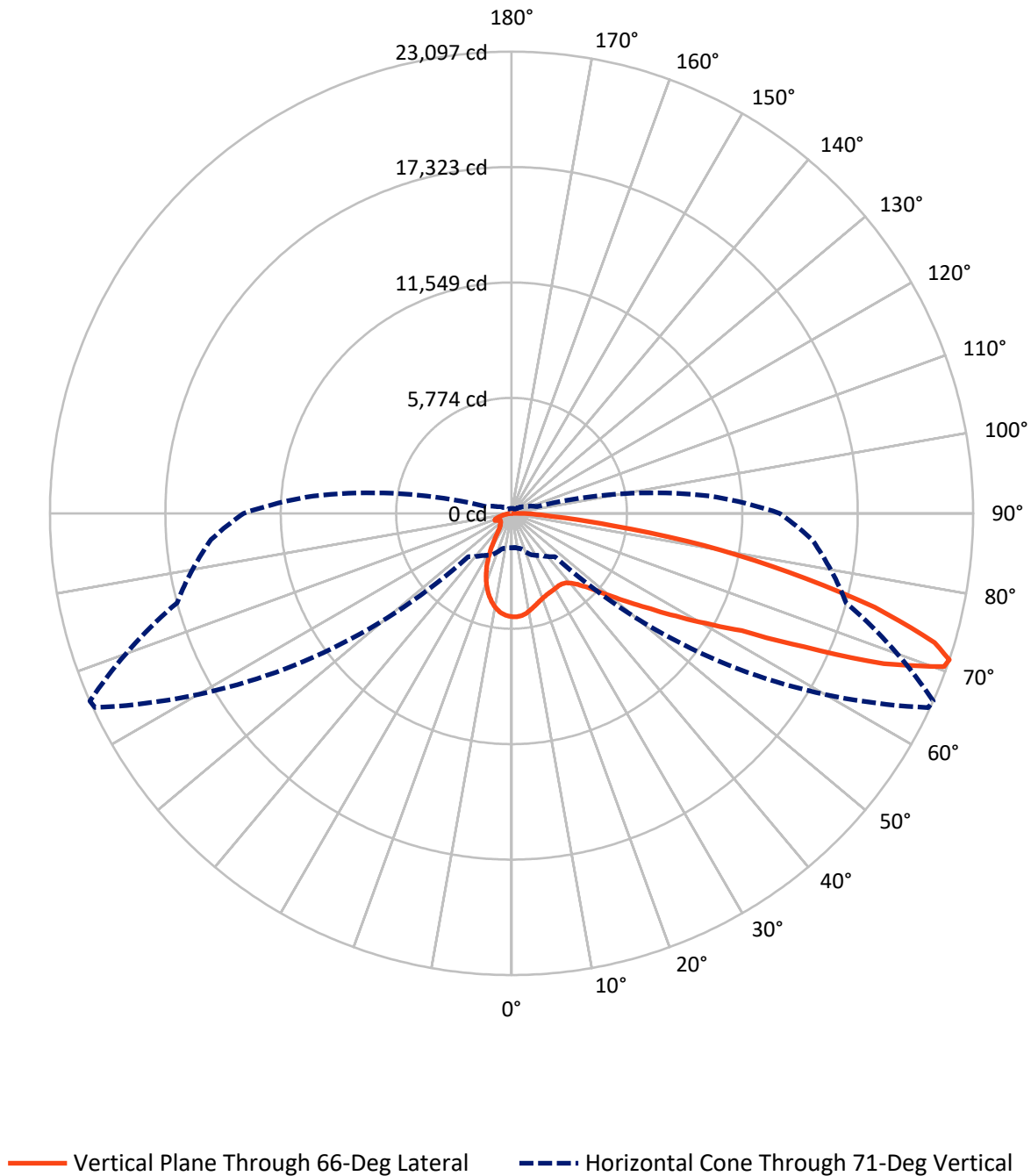
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 8.3 fc  
 Type III - Medium - N/A

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## Luminous Intensity Polar Plot



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**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 4185.2   | 0.0    | 4185.2  |
|                    | % Fixture | 18.5     | 0.0    | 18.5    |
| <b>Street Side</b> | Lumens    | 18397.8  | 0.0    | 18397.8 |
|                    | % Fixture | 81.5     | 0.0    | 81.5    |
| <b>Total</b>       | Lumens    | 22583.0  | 0.0    | 22583.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 455.4   | 2.0       |
| 10°-20°   | 1092.2  | 4.8       |
| 20°-30°   | 1467.1  | 6.5       |
| 30°-40°   | 1929.9  | 8.5       |
| 40°-50°   | 2807.5  | 12.4      |
| 50°-60°   | 4385.7  | 19.4      |
| 60°-70°   | 5493.8  | 24.3      |
| 70°-80°   | 4190.5  | 18.6      |
| 80°-90°   | 761.0   | 3.4       |
| 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°    | 22583.0 | 100.0     |
| 0°-180°   | 22583.0 | 100.0     |

**Coefficient of Utilization**



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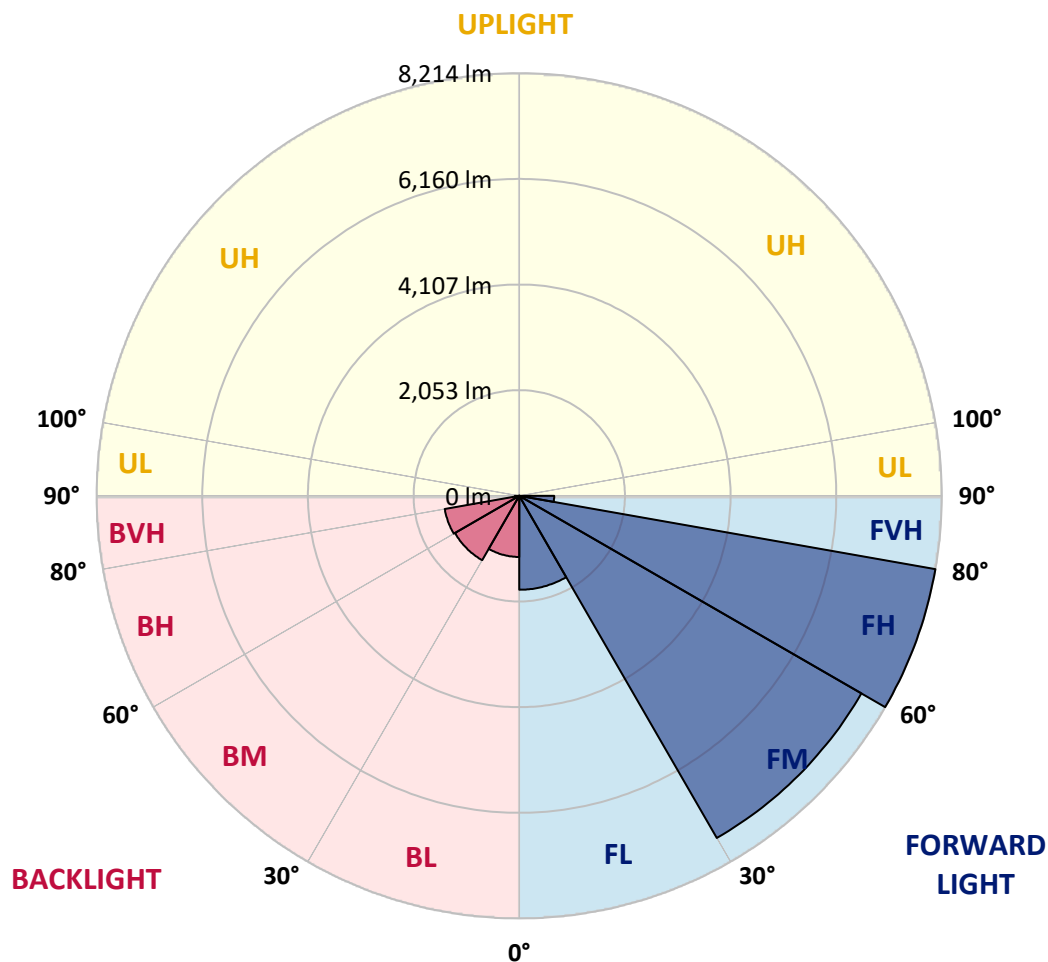
CATALOG NUMBER: GLEON-SA4B-760-U-SL2

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |          |
|------|-------------|--------|-----------|-------------------------|------|----------|
|      |             |        |           | B                       | U    | G        |
| FL   | (0°-30°)    | 1826.1 | 8.1       |                         |      |          |
| FM   | (30°-60°)   | 7679.4 | 34.0      |                         |      |          |
| FH   | (60°-80°)   | 8213.7 | 36.4      |                         |      | G4/12000 |
| FVH  | (80°-90°)   | 678.6  | 3.0       |                         |      | G4/750   |
| BL   | (0°-30°)    | 1188.5 | 5.3       | B3/2500                 |      |          |
| BM   | (30°-60°)   | 1443.8 | 6.4       | B2/2500                 |      |          |
| BH   | (60°-80°)   | 1470.6 | 6.5       | B3/2500                 |      | G3/2500  |
| BVH  | (80°-90°)   | 82.4   | 0.4       |                         |      | G1/100   |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |          |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |          |

**BUG Rating: B3-U0-G4**

Type III Medium



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CATALOG NUMBER: GLEON-SA4B-760-U-SL2

**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°     | 55°     | 65°     | 66°     | 75°     | 85°     |
|-------|--------|--------|--------|--------|--------|---------|---------|---------|---------|---------|---------|
| 0°    | 5173.3 | 5173.3 | 5173.3 | 5173.3 | 5173.3 | 5173.3  | 5173.3  | 5173.3  | 5173.3  | 5173.3  | 5173.3  |
| 2.5°  | 5077.4 | 5069.6 | 5093.0 | 5117.2 | 5126.5 | 5142.1  | 5165.5  | 5178.8  | 5178.0  | 5180.3  | 5172.5  |
| 5°    | 4740.6 | 4730.5 | 4777.2 | 4815.4 | 4888.7 | 4971.4  | 5072.0  | 5143.7  | 5145.3  | 5185.8  | 5196.7  |
| 7.5°  | 4421.7 | 4414.7 | 4468.5 | 4530.1 | 4615.1 | 4741.4  | 4904.3  | 5058.7  | 5068.1  | 5178.0  | 5216.2  |
| 10°   | 4166.0 | 4164.4 | 4216.6 | 4283.7 | 4382.7 | 4523.8  | 4711.0  | 4937.1  | 4951.1  | 5140.6  | 5219.3  |
| 12.5° | 3966.3 | 3969.5 | 4014.7 | 4091.1 | 4195.6 | 4342.9  | 4545.7  | 4800.6  | 4823.2  | 5081.3  | 5201.4  |
| 15°   | 3819.0 | 3831.5 | 3868.1 | 3945.3 | 4048.2 | 4197.9  | 4406.1  | 4674.3  | 4708.6  | 5015.0  | 5191.3  |
| 17.5° | 3734.8 | 3748.8 | 3774.5 | 3838.5 | 3935.2 | 4079.4  | 4276.7  | 4570.6  | 4601.8  | 4964.4  | 5192.0  |
| 20°   | 3709.8 | 3721.5 | 3736.3 | 3775.3 | 3857.2 | 3988.2  | 4174.5  | 4477.1  | 4510.6  | 4923.8  | 5199.8  |
| 22.5° | 3758.9 | 3767.5 | 3769.1 | 3766.0 | 3815.9 | 3922.7  | 4100.5  | 4408.4  | 4444.3  | 4897.3  | 5205.3  |
| 25°   | 3864.2 | 3875.9 | 3867.3 | 3838.5 | 3822.1 | 3887.6  | 4062.3  | 4363.2  | 4399.1  | 4877.8  | 5194.4  |
| 27.5° | 4022.5 | 4024.0 | 4017.0 | 3979.6 | 3902.4 | 3891.5  | 4050.6  | 4336.7  | 4371.0  | 4855.2  | 5171.8  |
| 30°   | 4237.7 | 4247.8 | 4235.3 | 4184.7 | 4058.4 | 3953.9  | 4064.6  | 4311.0  | 4342.2  | 4826.4  | 5135.1  |
| 32.5° | 4489.5 | 4514.5 | 4513.7 | 4460.7 | 4279.8 | 4093.4  | 4122.3  | 4295.4  | 4319.6  | 4796.0  | 5090.7  |
| 35°   | 4750.7 | 4785.0 | 4849.0 | 4826.4 | 4602.6 | 4314.1  | 4233.0  | 4320.3  | 4336.7  | 4792.1  | 5059.5  |
| 37.5° | 5022.1 | 5056.4 | 5188.1 | 5249.0 | 4987.0 | 4629.9  | 4407.7  | 4408.4  | 4416.2  | 4839.6  | 5057.2  |
| 40°   | 5305.9 | 5342.5 | 5540.6 | 5698.8 | 5485.2 | 5029.9  | 4689.1  | 4592.4  | 4583.9  | 4956.6  | 5103.2  |
| 42.5° | 5703.5 | 5736.3 | 5974.1 | 6176.0 | 6038.0 | 5542.1  | 5078.2  | 4876.3  | 4858.3  | 5185.8  | 5250.5  |
| 45°   | 6206.4 | 6234.5 | 6487.1 | 6703.1 | 6632.2 | 6126.9  | 5567.1  | 5266.9  | 5263.8  | 5567.9  | 5549.1  |
| 47.5° | 6804.5 | 6826.3 | 7053.2 | 7262.2 | 7287.9 | 6799.8  | 6181.5  | 5869.6  | 5818.9  | 6091.8  | 6011.5  |
| 50°   | 7427.4 | 7451.6 | 7606.0 | 7830.6 | 8021.6 | 7700.3  | 6972.1  | 6608.0  | 6540.1  | 6783.4  | 6666.5  |
| 52.5° | 7839.9 | 7871.9 | 8006.0 | 8290.6 | 8846.5 | 8687.4  | 7907.0  | 7503.1  | 7400.2  | 7621.6  | 7531.9  |
| 55°   | 7655.9 | 7727.6 | 7932.7 | 8388.8 | 9506.1 | 10195.4 | 9060.1  | 8547.1  | 8430.9  | 8614.9  | 8561.9  |
| 57.5° | 6819.3 | 6917.5 | 7197.4 | 7901.5 | 9598.9 | 11524.0 | 10803.6 | 9776.7  | 9694.8  | 9641.8  | 9666.0  |
| 60°   | 5290.3 | 5384.6 | 5731.6 | 6649.3 | 8952.5 | 12494.0 | 13427.3 | 11292.4 | 11173.9 | 10672.6 | 10694.4 |
| 62.5° | 3744.1 | 3696.6 | 3934.4 | 4605.7 | 7274.6 | 12607.8 | 16412.7 | 13319.7 | 12929.8 | 11761.0 | 11665.1 |
| 65°   | 2855.3 | 2844.4 | 2951.2 | 3164.8 | 4406.1 | 11245.7 | 18191.2 | 16727.0 | 16118.0 | 13041.3 | 12815.2 |
| 67.5° | 2346.1 | 2326.6 | 2431.9 | 2743.0 | 2837.3 | 7255.1  | 18230.2 | 20680.1 | 20082.0 | 14635.0 | 14145.4 |
| 70°   | 1929.0 | 1907.2 | 2005.4 | 2406.9 | 2622.1 | 3679.4  | 15343.0 | 22995.0 | 22963.0 | 16652.9 | 15149.6 |
| 71°   | 1729.4 | 1713.8 | 1831.5 | 2277.5 | 2576.1 | 3066.6  | 13247.2 | 23001.2 | 23097.1 | 17335.9 | 15090.4 |
| 72.5° | 1408.1 | 1413.6 | 1538.4 | 2027.2 | 2541.8 | 2707.9  | 9736.1  | 21929.1 | 22131.9 | 17987.0 | 14551.6 |
| 75°   | 935.6  | 940.3  | 1104.1 | 1559.4 | 2464.6 | 2649.4  | 5351.1  | 18401.0 | 18773.7 | 17597.1 | 13278.3 |
| 77.5° | 628.4  | 626.9  | 738.4  | 1069.8 | 2147.3 | 2649.4  | 3137.5  | 13762.5 | 14171.9 | 14001.9 | 10236.7 |
| 80°   | 432.7  | 429.6  | 508.4  | 738.4  | 1625.7 | 2681.4  | 2425.7  | 9644.9  | 9768.9  | 7561.6  | 4160.5  |
| 82.5° | 265.1  | 267.4  | 332.2  | 521.6  | 1106.4 | 2413.2  | 2290.0  | 5259.1  | 5124.2  | 2120.8  | 1039.3  |
| 85°   | 152.0  | 151.3  | 212.1  | 353.2  | 710.3  | 2036.6  | 2233.1  | 2263.5  | 2076.3  | 638.6   | 375.8   |
| 87.5° | 54.6   | 58.5   | 113.8  | 195.7  | 407.0  | 1418.3  | 1894.7  | 1177.4  | 1061.2  | 288.5   | 170.0   |
| 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: P319438

CATALOG NUMBER: GLEON-SA4B-760-U-SL2

**CANDELA DISTRIBUTION (continued):**

|       | 90°     | 95°     | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|---------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 5173.3  | 5173.3  | 5173.3 | 5173.3 | 5173.3 | 5173.3 | 5173.3 | 5173.3 | 5173.3 | 5173.3 | 5173.3 |
| 2.5°  | 5167.1  | 5171.8  | 5166.3 | 5135.1 | 5108.6 | 5065.7 | 5041.6 | 5008.0 | 4997.9 | 4993.2 | 5005.7 |
| 5°    | 5186.6  | 5188.1  | 5142.1 | 5060.3 | 4968.3 | 4859.9 | 4781.9 | 4686.0 | 4640.8 | 4621.3 | 4633.8 |
| 7.5°  | 5204.5  | 5197.5  | 5096.9 | 4940.2 | 4770.2 | 4581.5 | 4413.9 | 4260.3 | 4170.6 | 4134.0 | 4137.1 |
| 10°   | 5206.9  | 5177.2  | 5015.8 | 4773.3 | 4509.8 | 4233.0 | 3975.7 | 3738.7 | 3589.0 | 3491.5 | 3521.1 |
| 12.5° | 5182.7  | 5132.8  | 4896.5 | 4557.4 | 4191.7 | 3814.3 | 3466.6 | 3111.0 | 2897.4 | 2798.4 | 2801.5 |
| 15°   | 5164.0  | 5073.5  | 4749.9 | 4303.2 | 3812.0 | 3312.2 | 2837.3 | 2419.4 | 2191.7 | 2090.4 | 2042.8 |
| 17.5° | 5148.4  | 5009.6  | 4580.0 | 4017.0 | 3363.6 | 2729.7 | 2159.0 | 1786.3 | 1661.5 | 1631.9 | 1619.4 |
| 20°   | 5126.5  | 4941.8  | 4390.5 | 3685.7 | 2852.9 | 2077.9 | 1576.6 | 1392.5 | 1393.3 | 1427.6 | 1432.3 |
| 22.5° | 5096.1  | 4864.6  | 4188.6 | 3313.7 | 2304.8 | 1513.4 | 1235.8 | 1182.8 | 1236.6 | 1302.1 | 1313.8 |
| 25°   | 5050.9  | 4773.3  | 3964.0 | 2902.8 | 1757.5 | 1163.3 | 1055.7 | 1053.4 | 1118.9 | 1187.5 | 1197.6 |
| 27.5° | 4987.0  | 4654.0  | 3714.5 | 2461.5 | 1295.1 | 988.7  | 945.8  | 962.2  | 1010.5 | 1060.4 | 1064.3 |
| 30°   | 4901.2  | 4515.3  | 3439.3 | 1996.0 | 1015.2 | 880.3  | 875.6  | 890.4  | 920.0  | 955.1  | 958.3  |
| 32.5° | 4806.9  | 4374.1  | 3145.3 | 1545.4 | 869.4  | 821.8  | 826.5  | 833.5  | 847.5  | 861.6  | 864.7  |
| 35°   | 4721.1  | 4229.9  | 2844.4 | 1174.2 | 800.0  | 783.6  | 780.5  | 778.9  | 780.5  | 775.8  | 776.6  |
| 37.5° | 4665.7  | 4110.6  | 2530.9 | 934.9  | 760.2  | 750.1  | 740.7  | 729.0  | 715.8  | 708.0  | 709.5  |
| 40°   | 4645.5  | 4021.7  | 2213.6 | 807.8  | 727.5  | 720.4  | 702.5  | 677.6  | 662.0  | 657.3  | 657.3  |
| 42.5° | 4700.0  | 3975.7  | 1907.2 | 743.8  | 700.2  | 688.5  | 658.8  | 630.0  | 618.3  | 617.5  | 616.7  |
| 45°   | 4866.9  | 3994.4  | 1615.5 | 708.7  | 675.2  | 652.6  | 613.6  | 589.5  | 581.7  | 583.2  | 582.4  |
| 47.5° | 5166.3  | 4112.2  | 1366.0 | 685.4  | 650.3  | 620.6  | 577.0  | 557.5  | 548.1  | 548.1  | 548.9  |
| 50°   | 5675.5  | 4387.4  | 1167.2 | 665.9  | 629.2  | 591.0  | 550.5  | 526.3  | 513.8  | 513.0  | 513.0  |
| 52.5° | 6417.0  | 4880.2  | 1043.2 | 649.5  | 605.8  | 564.5  | 524.0  | 493.6  | 478.7  | 475.6  | 474.1  |
| 55°   | 7346.4  | 5586.6  | 1008.9 | 638.6  | 574.6  | 535.7  | 492.0  | 461.6  | 445.2  | 438.2  | 437.4  |
| 57.5° | 8385.7  | 6445.8  | 1076.8 | 625.3  | 542.7  | 501.3  | 456.9  | 428.1  | 410.9  | 402.3  | 401.5  |
| 60°   | 9437.5  | 7383.8  | 1353.6 | 606.6  | 516.2  | 463.9  | 421.0  | 394.5  | 377.4  | 368.0  | 366.5  |
| 62.5° | 10490.9 | 8372.4  | 1918.8 | 605.0  | 497.5  | 428.1  | 384.4  | 361.8  | 345.4  | 335.3  | 332.9  |
| 65°   | 11679.2 | 9454.7  | 2561.3 | 646.4  | 491.2  | 395.3  | 347.0  | 329.0  | 315.0  | 305.6  | 304.9  |
| 67.5° | 13043.6 | 10676.5 | 2499.7 | 731.4  | 512.3  | 365.7  | 311.9  | 297.8  | 287.7  | 279.9  | 279.1  |
| 70°   | 13683.8 | 10485.4 | 1553.9 | 791.4  | 541.9  | 336.8  | 278.4  | 268.2  | 260.4  | 255.0  | 252.6  |
| 71°   | 13415.6 | 9956.0  | 1302.9 | 784.4  | 538.8  | 324.4  | 265.1  | 257.3  | 249.5  | 244.8  | 242.5  |
| 72.5° | 12684.2 | 9079.6  | 1086.9 | 729.8  | 503.7  | 301.7  | 247.9  | 240.1  | 233.1  | 227.7  | 226.1  |
| 75°   | 11382.1 | 8108.9  | 870.1  | 583.2  | 401.5  | 255.0  | 217.5  | 209.0  | 203.5  | 200.4  | 197.3  |
| 77.5° | 8367.0  | 5787.0  | 672.9  | 460.8  | 295.5  | 208.2  | 185.6  | 179.3  | 173.9  | 169.2  | 166.9  |
| 80°   | 3205.4  | 2241.6  | 453.0  | 343.8  | 216.8  | 164.5  | 149.7  | 146.6  | 141.1  | 138.0  | 138.0  |
| 82.5° | 863.1   | 669.8   | 241.7  | 208.2  | 145.0  | 120.1  | 114.6  | 113.1  | 108.4  | 102.1  | 102.9  |
| 85°   | 349.3   | 295.5   | 135.7  | 114.6  | 88.9   | 71.0   | 77.2   | 78.0   | 72.5   | 64.7   | 65.5   |
| 87.5° | 153.6   | 125.5   | 75.6   | 50.7   | 39.0   | 27.3   | 35.1   | 35.1   | 32.0   | 26.5   | 24.2   |
| 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            |

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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 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)