

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: P319569

Luminaire Tested: **GLEON-SA5C-722-U-SL2**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P319569  
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-SA5C-722-U-SL2  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(5) 70 CRI, 2200K, 1050mA 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: 25458 lumens  
Efficiency: N/A  
Efficacy: 91.2 lumens/watt  
Luminous Opening: Rectangular (W 1.5' x L: 1' x H: 0')  
IES Classification: Type III - Medium  
BUG Rating: B3 - U0 - G5

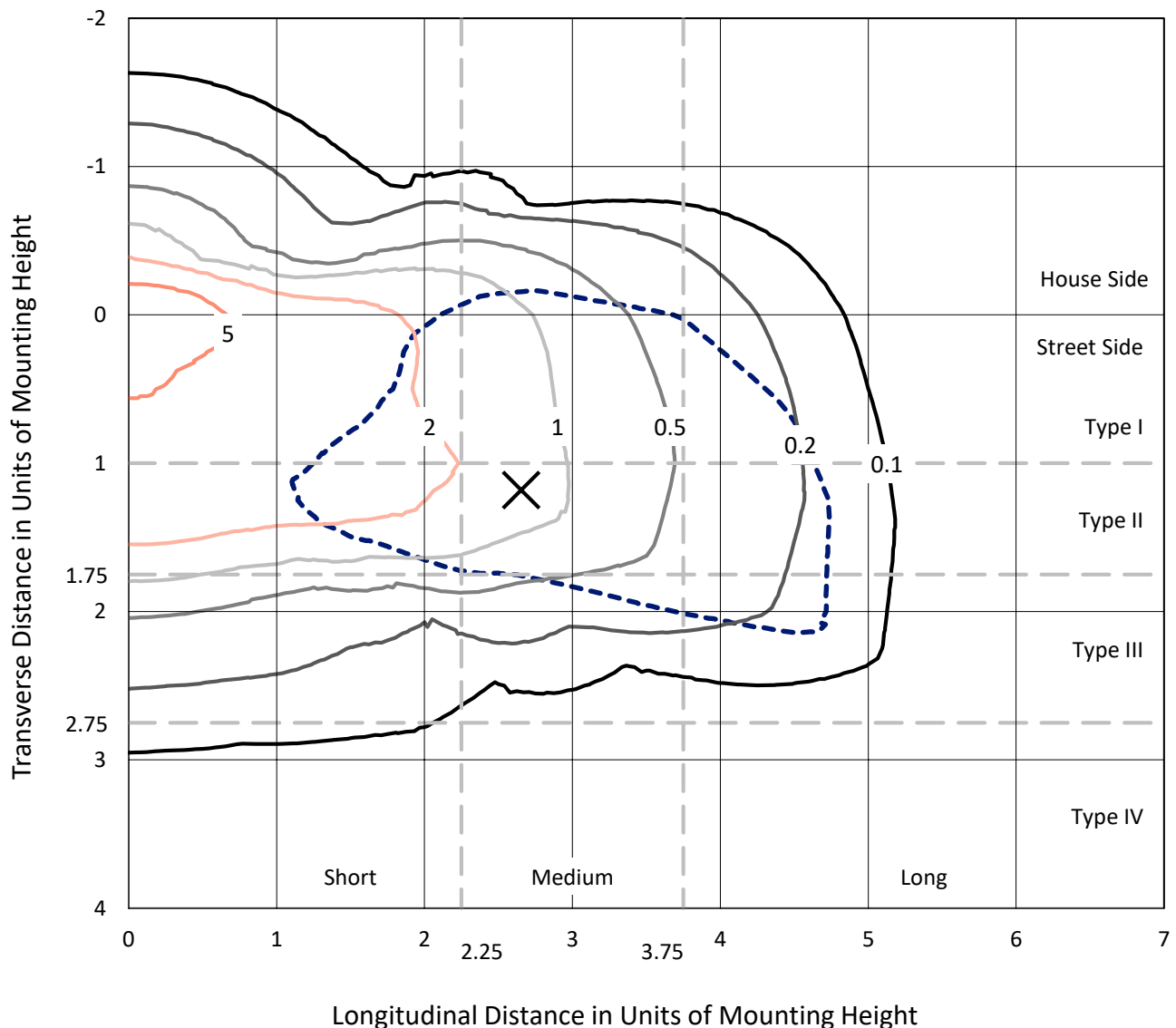
Input Watts (W): 279  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



REPORT NUMBER: P319569  
 CATALOG NUMBER: GLEON-SA5C-722-U-SL2

## Iso-Footcandle Lines of Horizontal Illumination

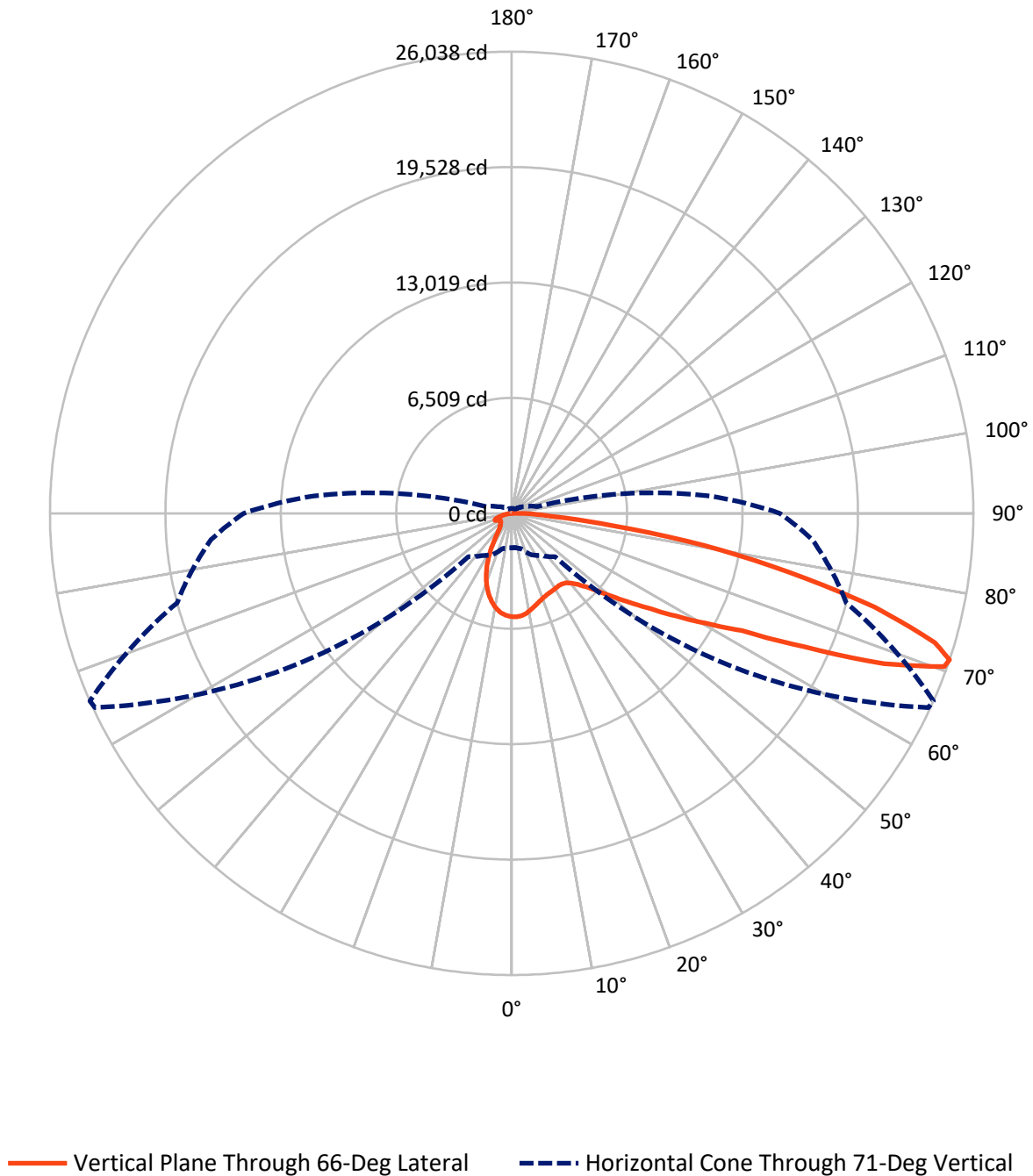
× Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 9.3 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    | 4718.1   | 0.0    | 4718.1  |
|                    | % Fixture | 18.5     | 0.0    | 18.5    |
| <b>Street Side</b> | Lumens    | 20739.9  | 0.0    | 20739.9 |
|                    | % Fixture | 81.5     | 0.0    | 81.5    |
| <b>Total</b>       | Lumens    | 25458.0  | 0.0    | 25458.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 513.3   | 2.0       |
| 10°-20°   | 1231.2  | 4.8       |
| 20°-30°   | 1653.9  | 6.5       |
| 30°-40°   | 2175.6  | 8.5       |
| 40°-50°   | 3165.0  | 12.4      |
| 50°-60°   | 4944.0  | 19.4      |
| 60°-70°   | 6193.2  | 24.3      |
| 70°-80°   | 4724.0  | 18.6      |
| 80°-90°   | 857.8   | 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°    | 25458.0 | 100.0     |
| 0°-180°   | 25458.0 | 100.0     |

**Coefficient of Utilization**



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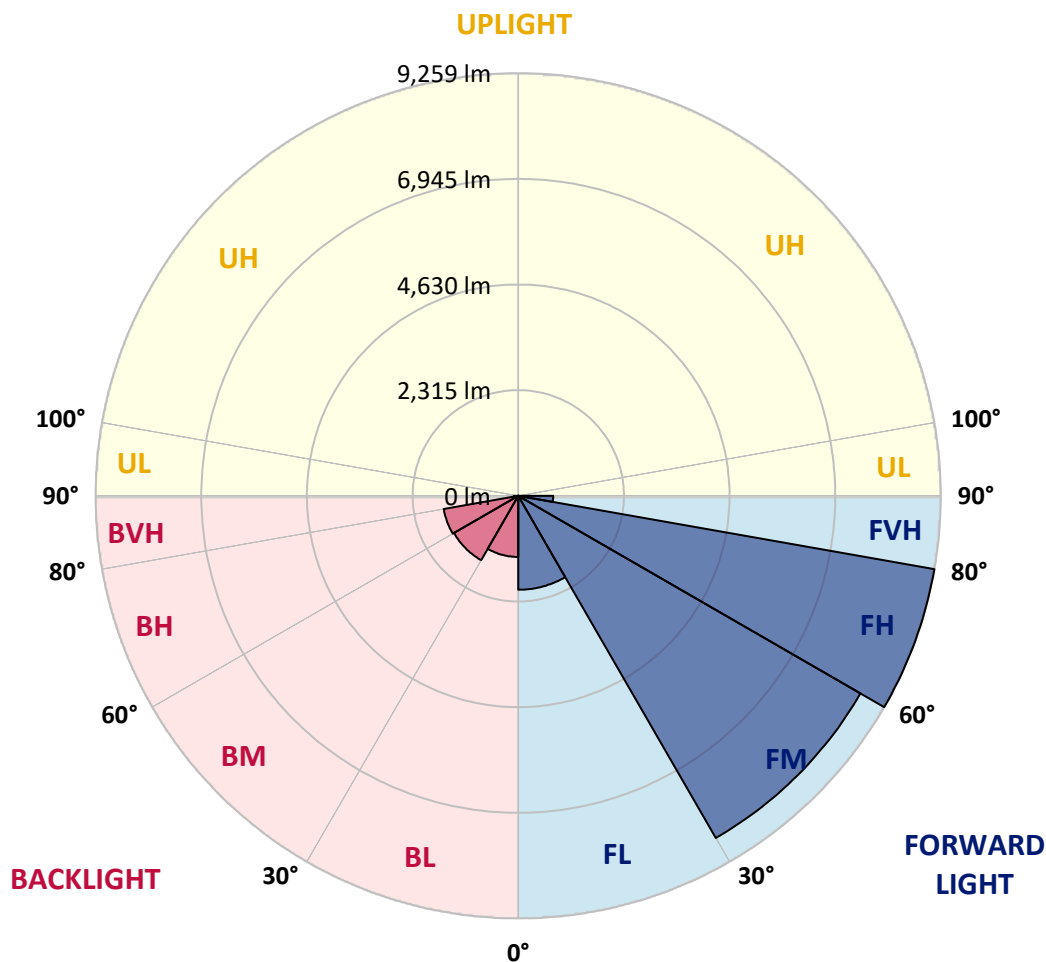
CATALOG NUMBER: GLEON-SA5C-722-U-SL2

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |          |
|------|-------------|--------|-----------|-------------------------|------|----------|
|      |             |        |           | B                       | U    | G        |
| FL   | (0°-30°)    | 2058.6 | 8.1       |                         |      |          |
| FM   | (30°-60°)   | 8657.0 | 34.0      |                         |      |          |
| FH   | (60°-80°)   | 9259.3 | 36.4      |                         |      | G4/12000 |
| FVH  | (80°-90°)   | 765.0  | 3.0       |                         |      | G5       |
| BL   | (0°-30°)    | 1339.8 | 5.3       | B3/2500                 |      |          |
| BM   | (30°-60°)   | 1627.6 | 6.4       | B2/2500                 |      |          |
| BH   | (60°-80°)   | 1657.8 | 6.5       | B3/2500                 |      | G3/2500  |
| BVH  | (80°-90°)   | 92.9   | 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-G5**

Type III Medium



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°     | 45°     | 55°     | 65°     | 66°     | 75°     | 85°     |
|-------|--------|--------|--------|--------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 5831.9 | 5831.9 | 5831.9 | 5831.9 | 5831.9  | 5831.9  | 5831.9  | 5831.9  | 5831.9  | 5831.9  | 5831.9  |
| 2.5°  | 5723.8 | 5715.0 | 5741.4 | 5768.6 | 5779.2  | 5796.8  | 5823.1  | 5838.1  | 5837.2  | 5839.8  | 5831.1  |
| 5°    | 5344.1 | 5332.7 | 5385.4 | 5428.5 | 5511.1  | 5604.3  | 5717.7  | 5798.5  | 5800.3  | 5846.0  | 5858.3  |
| 7.5°  | 4984.6 | 4976.7 | 5037.4 | 5106.8 | 5202.6  | 5345.0  | 5528.7  | 5702.7  | 5713.3  | 5837.2  | 5880.3  |
| 10°   | 4696.3 | 4694.6 | 4753.4 | 4829.0 | 4940.7  | 5099.8  | 5310.7  | 5565.6  | 5581.4  | 5795.0  | 5883.8  |
| 12.5° | 4471.3 | 4474.8 | 4525.8 | 4611.9 | 4729.7  | 4895.8  | 5124.4  | 5411.8  | 5437.3  | 5728.2  | 5863.6  |
| 15°   | 4305.2 | 4319.2 | 4360.5 | 4447.6 | 4563.6  | 4732.3  | 4967.0  | 5269.4  | 5308.1  | 5653.5  | 5852.2  |
| 17.5° | 4210.2 | 4226.1 | 4255.1 | 4327.1 | 4436.1  | 4598.7  | 4821.1  | 5152.5  | 5187.7  | 5596.4  | 5853.0  |
| 20°   | 4182.1 | 4195.3 | 4212.0 | 4256.0 | 4348.2  | 4495.9  | 4706.0  | 5047.0  | 5084.8  | 5550.7  | 5861.8  |
| 22.5° | 4237.5 | 4247.2 | 4248.9 | 4245.4 | 4301.7  | 4422.1  | 4622.5  | 4969.7  | 5010.1  | 5520.8  | 5868.0  |
| 25°   | 4356.2 | 4369.3 | 4359.7 | 4327.1 | 4308.7  | 4382.5  | 4579.4  | 4918.7  | 4959.1  | 5498.8  | 5855.7  |
| 27.5° | 4534.6 | 4536.3 | 4528.4 | 4486.2 | 4399.2  | 4386.9  | 4566.2  | 4888.8  | 4927.5  | 5473.3  | 5830.2  |
| 30°   | 4777.2 | 4788.6 | 4774.5 | 4717.4 | 4575.0  | 4457.2  | 4582.0  | 4859.8  | 4895.0  | 5440.8  | 5788.9  |
| 32.5° | 5061.1 | 5089.2 | 5088.3 | 5028.6 | 4824.6  | 4614.6  | 4647.1  | 4842.2  | 4869.5  | 5406.5  | 5738.8  |
| 35°   | 5355.5 | 5394.2 | 5466.3 | 5440.8 | 5188.5  | 4863.3  | 4771.9  | 4870.3  | 4888.8  | 5402.1  | 5703.6  |
| 37.5° | 5661.4 | 5700.1 | 5848.6 | 5917.2 | 5621.9  | 5219.3  | 4968.8  | 4969.7  | 4978.5  | 5455.7  | 5701.0  |
| 40°   | 5981.4 | 6022.7 | 6245.9 | 6424.4 | 6183.5  | 5670.2  | 5286.1  | 5177.1  | 5167.4  | 5587.6  | 5752.8  |
| 42.5° | 6429.6 | 6466.5 | 6734.6 | 6962.3 | 6806.7  | 6247.7  | 5724.7  | 5497.0  | 5476.8  | 5846.0  | 5919.0  |
| 45°   | 6996.6 | 7028.2 | 7313.0 | 7556.5 | 7476.5  | 6906.9  | 6275.8  | 5937.4  | 5933.9  | 6276.7  | 6255.6  |
| 47.5° | 7670.7 | 7695.3 | 7951.1 | 8186.7 | 8215.7  | 7665.5  | 6968.4  | 6616.9  | 6559.7  | 6867.4  | 6776.8  |
| 50°   | 8373.0 | 8400.3 | 8574.3 | 8827.4 | 9042.8  | 8680.7  | 7859.7  | 7449.2  | 7372.8  | 7647.0  | 7515.2  |
| 52.5° | 8838.0 | 8874.0 | 9025.2 | 9346.0 | 9972.7  | 9793.4  | 8913.6  | 8458.3  | 8342.3  | 8591.9  | 8490.8  |
| 55°   | 8630.6 | 8711.4 | 8942.6 | 9456.8 | 10716.3 | 11493.4 | 10213.6 | 9635.2  | 9504.3  | 9711.7  | 9651.9  |
| 57.5° | 7687.4 | 7798.2 | 8113.7 | 8907.4 | 10820.9 | 12991.1 | 12178.9 | 11021.3 | 10929.1 | 10869.3 | 10896.5 |
| 60°   | 5963.8 | 6070.1 | 6461.3 | 7495.8 | 10092.3 | 14084.5 | 15136.7 | 12730.1 | 12596.5 | 12031.3 | 12055.9 |
| 62.5° | 4220.8 | 4167.2 | 4435.3 | 5192.0 | 8200.7  | 14212.9 | 18502.2 | 15015.4 | 14575.9 | 13258.3 | 13150.2 |
| 65°   | 3218.8 | 3206.5 | 3326.9 | 3567.7 | 4967.0  | 12677.3 | 20507.1 | 18856.4 | 18170.0 | 14701.6 | 14446.7 |
| 67.5° | 2644.8 | 2622.8 | 2741.5 | 3092.2 | 3198.6  | 8178.8  | 20551.1 | 23312.8 | 22638.6 | 16498.2 | 15946.2 |
| 70°   | 2174.6 | 2149.9 | 2260.7 | 2713.4 | 2956.0  | 4147.8  | 17296.3 | 25922.4 | 25886.4 | 18772.9 | 17078.3 |
| 71°   | 1949.5 | 1932.0 | 2064.7 | 2567.5 | 2904.1  | 3457.0  | 14933.6 | 25929.5 | 26037.6 | 19542.9 | 17011.5 |
| 72.5° | 1587.4 | 1593.6 | 1734.2 | 2285.3 | 2865.4  | 3052.6  | 10975.6 | 24720.9 | 24949.4 | 20276.9 | 16404.1 |
| 75°   | 1054.8 | 1060.0 | 1244.6 | 1757.9 | 2778.4  | 2986.7  | 6032.3  | 20743.6 | 21163.7 | 19837.4 | 14968.8 |
| 77.5° | 708.4  | 706.7  | 832.4  | 1205.9 | 2420.7  | 2986.7  | 3537.0  | 15514.6 | 15976.1 | 15784.5 | 11539.9 |
| 80°   | 487.8  | 484.3  | 573.1  | 832.4  | 1832.6  | 3022.8  | 2734.5  | 10872.8 | 11012.6 | 8524.2  | 4690.2  |
| 82.5° | 298.8  | 301.5  | 374.4  | 588.0  | 1247.3  | 2720.4  | 2581.5  | 5928.6  | 5776.6  | 2390.8  | 1171.7  |
| 85°   | 171.4  | 170.5  | 239.1  | 398.2  | 800.7   | 2295.9  | 2517.4  | 2551.6  | 2340.7  | 719.9   | 423.7   |
| 87.5° | 61.5   | 65.9   | 128.3  | 220.6  | 458.8   | 1598.8  | 2135.9  | 1327.2  | 1196.3  | 325.2   | 191.6   |
| 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: P319569

CATALOG NUMBER: GLEON-SA5C-722-U-SL2

**CANDELA DISTRIBUTION (continued):**

|       | 90°     | 95°     | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|---------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 5831.9  | 5831.9  | 5831.9 | 5831.9 | 5831.9 | 5831.9 | 5831.9 | 5831.9 | 5831.9 | 5831.9 | 5831.9 |
| 2.5°  | 5824.9  | 5830.2  | 5824.0 | 5788.9 | 5759.0 | 5710.6 | 5683.4 | 5645.6 | 5634.2 | 5628.9 | 5643.0 |
| 5°    | 5846.9  | 5848.6  | 5796.8 | 5704.5 | 5600.8 | 5478.6 | 5390.7 | 5282.6 | 5231.6 | 5209.6 | 5223.7 |
| 7.5°  | 5867.1  | 5859.2  | 5745.8 | 5569.1 | 5377.5 | 5164.8 | 4975.8 | 4802.7 | 4701.6 | 4660.3 | 4663.8 |
| 10°   | 5869.7  | 5836.3  | 5654.4 | 5381.0 | 5083.9 | 4771.9 | 4481.8 | 4214.6 | 4045.9 | 3936.0 | 3969.4 |
| 12.5° | 5842.5  | 5786.2  | 5519.9 | 5137.6 | 4725.3 | 4299.9 | 3907.9 | 3507.1 | 3266.2 | 3154.6 | 3158.1 |
| 15°   | 5821.4  | 5719.4  | 5354.7 | 4851.0 | 4297.3 | 3733.8 | 3198.6 | 2727.4 | 2470.8 | 2356.5 | 2302.9 |
| 17.5° | 5803.8  | 5647.4  | 5163.0 | 4528.4 | 3791.9 | 3077.3 | 2433.9 | 2013.7 | 1873.1 | 1839.7 | 1825.6 |
| 20°   | 5779.2  | 5570.9  | 4949.5 | 4154.9 | 3216.1 | 2342.4 | 1777.3 | 1569.8 | 1570.7 | 1609.4 | 1614.7 |
| 22.5° | 5744.9  | 5483.9  | 4721.8 | 3735.6 | 2598.2 | 1706.1 | 1393.2 | 1333.4 | 1394.0 | 1467.9 | 1481.1 |
| 25°   | 5693.9  | 5381.0  | 4468.7 | 3272.4 | 1981.2 | 1311.4 | 1190.1 | 1187.5 | 1261.3 | 1338.7 | 1350.1 |
| 27.5° | 5621.9  | 5246.5  | 4187.4 | 2774.9 | 1460.0 | 1114.5 | 1066.2 | 1084.6 | 1139.1 | 1195.4 | 1199.8 |
| 30°   | 5525.2  | 5090.1  | 3877.1 | 2250.2 | 1144.4 | 992.4  | 987.1  | 1003.8 | 1037.2 | 1076.7 | 1080.2 |
| 32.5° | 5418.8  | 4931.0  | 3545.7 | 1742.1 | 980.0  | 926.4  | 931.7  | 939.6  | 955.4  | 971.3  | 974.8  |
| 35°   | 5322.1  | 4768.4  | 3206.5 | 1323.7 | 901.8  | 883.4  | 879.8  | 878.1  | 879.8  | 874.6  | 875.4  |
| 37.5° | 5259.7  | 4633.9  | 2853.1 | 1053.9 | 857.0  | 845.6  | 835.0  | 821.8  | 806.9  | 798.1  | 799.9  |
| 40°   | 5236.9  | 4533.7  | 2495.4 | 910.6  | 820.1  | 812.2  | 791.9  | 763.8  | 746.2  | 741.0  | 741.0  |
| 42.5° | 5298.4  | 4481.8  | 2149.9 | 838.5  | 789.3  | 776.1  | 742.7  | 710.2  | 697.0  | 696.1  | 695.3  |
| 45°   | 5486.5  | 4502.9  | 1821.2 | 799.0  | 761.2  | 735.7  | 691.7  | 664.5  | 655.7  | 657.5  | 656.6  |
| 47.5° | 5824.0  | 4635.7  | 1539.9 | 772.6  | 733.1  | 699.7  | 650.4  | 628.5  | 617.9  | 617.9  | 618.8  |
| 50°   | 6398.0  | 4945.9  | 1315.8 | 750.6  | 709.3  | 666.3  | 620.5  | 593.3  | 579.2  | 578.4  | 578.4  |
| 52.5° | 7233.9  | 5501.4  | 1176.1 | 732.2  | 683.0  | 636.4  | 590.7  | 556.4  | 539.7  | 536.2  | 534.4  |
| 55°   | 8281.6  | 6297.8  | 1137.4 | 719.9  | 647.8  | 603.8  | 554.6  | 520.3  | 501.9  | 494.0  | 493.1  |
| 57.5° | 9453.3  | 7266.4  | 1213.9 | 704.9  | 611.8  | 565.2  | 515.1  | 482.6  | 463.2  | 453.5  | 452.7  |
| 60°   | 10639.0 | 8323.8  | 1525.9 | 683.8  | 581.9  | 523.0  | 474.6  | 444.8  | 425.4  | 414.9  | 413.1  |
| 62.5° | 11826.5 | 9438.3  | 2163.1 | 682.1  | 560.8  | 482.6  | 433.3  | 407.8  | 389.4  | 378.0  | 375.3  |
| 65°   | 13166.0 | 10658.3 | 2887.4 | 728.7  | 553.7  | 445.6  | 391.1  | 370.9  | 355.1  | 344.6  | 343.7  |
| 67.5° | 14704.2 | 12035.7 | 2818.0 | 824.5  | 577.5  | 412.2  | 351.6  | 335.8  | 324.3  | 315.5  | 314.7  |
| 70°   | 15425.8 | 11820.3 | 1751.8 | 892.1  | 610.9  | 379.7  | 313.8  | 302.4  | 293.6  | 287.4  | 284.8  |
| 71°   | 15123.5 | 11223.5 | 1468.8 | 884.2  | 607.4  | 365.6  | 298.8  | 290.1  | 281.3  | 276.0  | 273.4  |
| 72.5° | 14299.0 | 10235.6 | 1225.3 | 822.7  | 567.8  | 340.2  | 279.5  | 270.7  | 262.8  | 256.7  | 254.9  |
| 75°   | 12831.1 | 9141.2  | 980.9  | 657.5  | 452.7  | 287.4  | 245.2  | 235.6  | 229.4  | 225.9  | 222.4  |
| 77.5° | 9432.2  | 6523.7  | 758.5  | 519.5  | 333.1  | 234.7  | 209.2  | 202.2  | 196.0  | 190.7  | 188.1  |
| 80°   | 3613.4  | 2527.0  | 510.7  | 387.6  | 244.4  | 185.5  | 168.8  | 165.2  | 159.1  | 155.6  | 155.6  |
| 82.5° | 973.0   | 755.0   | 272.5  | 234.7  | 163.5  | 135.4  | 129.2  | 127.4  | 122.2  | 115.1  | 116.0  |
| 85°   | 393.8   | 333.1   | 152.9  | 129.2  | 100.2  | 80.0   | 87.0   | 87.9   | 81.7   | 73.0   | 73.8   |
| 87.5° | 173.2   | 141.5   | 85.3   | 57.1   | 43.9   | 30.8   | 39.6   | 39.6   | 36.0   | 29.9   | 27.2   |
| 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: SP1-1908-441-10-R4

Test Date: 10/25/2019

Luminaire Tested: SA1C-722-U-5WQ

Data in this report applies to families of products SA1C-722-U-5WQ.

### Test Information

Test Method: LM-79-2008 Report  
 Number: SP1-1908-441-10-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-722-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):                  | 2237    | CRI (Ra): | 72.0 |      |       |
| CIE u':                   | 0.2876  | R1:       | 68.9 | R9:  | -17.4 |
| CIE v':                   | 0.5346  | R2:       | 83.0 | R10: | 61.3  |
| Duv:                      | -0.0006 | R3:       | 95.2 | R11: | 59.8  |
| CIE x:                    | 0.5005  | R4:       | 66.2 | R12: | 50.5  |
| CIE y:                    | 0.4134  | R5:       | 65.9 | R13: | 71.1  |
| CIE z:                    | 0.0860  | R6:       | 76.3 | R14: | 96.9  |
| Peak Wavelength (nm):     | 603     | R7:       | 76.7 |      |       |
| Dominant Wavelength (nm): | 587     | R8:       | 43.8 |      |       |
| Purity:                   | 74.5    |           |      |      |       |
| Rf:                       | 69.8    |           |      |      |       |
| Rg:                       | 99.2    |           |      |      |       |



### Test Conditions

Stabilization Time: 71M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 24.7/41%  
 Sphere Temperature (°C): 25.6

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| 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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Point lies inside the ANSI 2200K 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       | 1768             | NR               | 490       | 5206             | NR               | 620       | 130919           | NR               | 750       | 8553             | NR               | 880       | 2713             | NR               |
| 365       | 1569             | NR               | 495       | 7286             | NR               | 625       | 125335           | NR               | 755       | 7696             | NR               | 885       | 2316             | NR               |
| 370       | 1594             | NR               | 500       | 10654            | NR               | 630       | 118388           | NR               | 760       | 6978             | NR               | 890       | 2539             | NR               |
| 375       | 1744             | NR               | 505       | 15189            | NR               | 635       | 111855           | NR               | 765       | 6377             | NR               | 895       | 1933             | NR               |
| 380       | 1659             | NR               | 510       | 20541            | NR               | 640       | 104062           | NR               | 770       | 5600             | NR               | 900       | 2216             | NR               |
| 385       | 1504             | NR               | 515       | 26492            | NR               | 645       | 96365            | NR               | 775       | 5000             | NR               | 905       | 2067             | NR               |
| 390       | 1541             | NR               | 520       | 32294            | NR               | 650       | 88651            | NR               | 780       | 4709             | NR               | 910       | 1959             | NR               |
| 395       | 1355             | NR               | 525       | 38123            | NR               | 655       | 81152            | NR               | 785       | 4305             | NR               | 915       | 1874             | NR               |
| 400       | 1243             | NR               | 530       | 43232            | NR               | 660       | 73523            | NR               | 790       | 4040             | NR               | 920       | 1484             | NR               |
| 405       | 1417             | NR               | 535       | 48012            | NR               | 665       | 66123            | NR               | 795       | 3642             | NR               | 925       | 1914             | NR               |
| 410       | 2147             | NR               | 540       | 52623            | NR               | 670       | 58677            | NR               | 800       | 3594             | NR               | 930       | 1948             | NR               |
| 415       | 3837             | NR               | 545       | 57516            | NR               | 675       | 52349            | NR               | 805       | 3190             | NR               | 935       | 2079             | NR               |
| 420       | 7159             | NR               | 550       | 62613            | NR               | 680       | 46159            | NR               | 810       | 3241             | NR               | 940       | 2263             | NR               |
| 425       | 12599            | NR               | 555       | 68554            | NR               | 685       | 40525            | NR               | 815       | 2732             | NR               | 945       | 1688             | NR               |
| 430       | 19019            | NR               | 560       | 75325            | NR               | 690       | 35615            | NR               | 820       | 2612             | NR               | 950       | 1560             | NR               |
| 435       | 24875            | NR               | 565       | 82533            | NR               | 695       | 31158            | NR               | 825       | 2966             | NR               | 955       | 2826             | NR               |
| 440       | 29103            | NR               | 570       | 90909            | NR               | 700       | 27409            | NR               | 830       | 2574             | NR               | 960       | 1477             | NR               |
| 445       | 29901            | NR               | 575       | 99621            | NR               | 705       | 24204            | NR               | 835       | 2633             | NR               | 965       | 1568             | NR               |
| 450       | 24862            | NR               | 580       | 108484           | NR               | 710       | 21558            | NR               | 840       | 2526             | NR               | 970       | 2030             | NR               |
| 455       | 15942            | NR               | 585       | 116679           | NR               | 715       | 19222            | NR               | 845       | 2631             | NR               | 975       | 1986             | NR               |
| 460       | 9916             | NR               | 590       | 123752           | NR               | 720       | 17310            | NR               | 850       | 2079             | NR               | 980       | 2540             | NR               |
| 465       | 7051             | NR               | 595       | 129324           | NR               | 725       | 15280            | NR               | 855       | 2309             | NR               | 985       | 1139             | NR               |
| 470       | 5227             | NR               | 600       | 134082           | NR               | 730       | 13282            | NR               | 860       | 2528             | NR               | 990       | 2018             | NR               |
| 475       | 4257             | NR               | 605       | 135698           | NR               | 735       | 11753            | NR               | 865       | 2121             | NR               | 995       | 3445             | NR               |
| 480       | 4052             | NR               | 610       | 135144           | NR               | 740       | 10654            | NR               | 870       | 2751             | NR               | 1000      | 3704             | NR               |
| 485       | 4298             | NR               | 615       | 134180           | NR               | 745       | 9451             | NR               | 875       | 2317             | NR               |           |                  |                  |

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**Scotopic Flux vs. Wavelength**



**Scotopic Lumens: 4696.9**

**S/P: 0.85**

| 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       | 1768             | NR               | 490       | 5206             | NR               | 620       | 130919           | NR               | 750       | 8553             | NR               | 880       | 2713             | NR               |
| 365       | 1569             | NR               | 495       | 7286             | NR               | 625       | 125335           | NR               | 755       | 7696             | NR               | 885       | 2316             | NR               |
| 370       | 1594             | NR               | 500       | 10654            | NR               | 630       | 118388           | NR               | 760       | 6978             | NR               | 890       | 2539             | NR               |
| 375       | 1744             | NR               | 505       | 15189            | NR               | 635       | 111855           | NR               | 765       | 6377             | NR               | 895       | 1933             | NR               |
| 380       | 1659             | NR               | 510       | 20541            | NR               | 640       | 104062           | NR               | 770       | 5600             | NR               | 900       | 2216             | NR               |
| 385       | 1504             | NR               | 515       | 26492            | NR               | 645       | 96365            | NR               | 775       | 5000             | NR               | 905       | 2067             | NR               |
| 390       | 1541             | NR               | 520       | 32294            | NR               | 650       | 88651            | NR               | 780       | 4709             | NR               | 910       | 1959             | NR               |
| 395       | 1355             | NR               | 525       | 38123            | NR               | 655       | 81152            | NR               | 785       | 4305             | NR               | 915       | 1874             | NR               |
| 400       | 1243             | NR               | 530       | 43232            | NR               | 660       | 73523            | NR               | 790       | 4040             | NR               | 920       | 1484             | NR               |
| 405       | 1417             | NR               | 535       | 48012            | NR               | 665       | 66123            | NR               | 795       | 3642             | NR               | 925       | 1914             | NR               |
| 410       | 2147             | NR               | 540       | 52623            | NR               | 670       | 58677            | NR               | 800       | 3594             | NR               | 930       | 1948             | NR               |
| 415       | 3837             | NR               | 545       | 57516            | NR               | 675       | 52349            | NR               | 805       | 3190             | NR               | 935       | 2079             | NR               |
| 420       | 7159             | NR               | 550       | 62613            | NR               | 680       | 46159            | NR               | 810       | 3241             | NR               | 940       | 2263             | NR               |
| 425       | 12599            | NR               | 555       | 68554            | NR               | 685       | 40525            | NR               | 815       | 2732             | NR               | 945       | 1688             | NR               |
| 430       | 19019            | NR               | 560       | 75325            | NR               | 690       | 35615            | NR               | 820       | 2612             | NR               | 950       | 1560             | NR               |
| 435       | 24875            | NR               | 565       | 82533            | NR               | 695       | 31158            | NR               | 825       | 2966             | NR               | 955       | 2826             | NR               |
| 440       | 29103            | NR               | 570       | 90909            | NR               | 700       | 27409            | NR               | 830       | 2574             | NR               | 960       | 1477             | NR               |
| 445       | 29901            | NR               | 575       | 99621            | NR               | 705       | 24204            | NR               | 835       | 2633             | NR               | 965       | 1568             | NR               |
| 450       | 24862            | NR               | 580       | 108484           | NR               | 710       | 21558            | NR               | 840       | 2526             | NR               | 970       | 2030             | NR               |
| 455       | 15942            | NR               | 585       | 116679           | NR               | 715       | 19222            | NR               | 845       | 2631             | NR               | 975       | 1986             | NR               |
| 460       | 9916             | NR               | 590       | 123752           | NR               | 720       | 17310            | NR               | 850       | 2079             | NR               | 980       | 2540             | NR               |
| 465       | 7051             | NR               | 595       | 129324           | NR               | 725       | 15280            | NR               | 855       | 2309             | NR               | 985       | 1139             | NR               |
| 470       | 5227             | NR               | 600       | 134082           | NR               | 730       | 13282            | NR               | 860       | 2528             | NR               | 990       | 2018             | NR               |
| 475       | 4257             | NR               | 605       | 135698           | NR               | 735       | 11753            | NR               | 865       | 2121             | NR               | 995       | 3445             | NR               |
| 480       | 4052             | NR               | 610       | 135144           | NR               | 740       | 10654            | NR               | 870       | 2751             | NR               | 1000      | 3704             | NR               |
| 485       | 4298             | NR               | 615       | 134180           | NR               | 745       | 9451             | NR               | 875       | 2317             | NR               |           |                  |                  |

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**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: 1470.8 M/P: 0.27**

| 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       | 1768             | NR               | 490       | 5206             | NR               | 620       | 130919           | NR               | 750       | 8553             | NR               | 880       | 2713             | NR               |
| 365       | 1569             | NR               | 495       | 7286             | NR               | 625       | 125335           | NR               | 755       | 7696             | NR               | 885       | 2316             | NR               |
| 370       | 1594             | NR               | 500       | 10654            | NR               | 630       | 118388           | NR               | 760       | 6978             | NR               | 890       | 2539             | NR               |
| 375       | 1744             | NR               | 505       | 15189            | NR               | 635       | 111855           | NR               | 765       | 6377             | NR               | 895       | 1933             | NR               |
| 380       | 1659             | NR               | 510       | 20541            | NR               | 640       | 104062           | NR               | 770       | 5600             | NR               | 900       | 2216             | NR               |
| 385       | 1504             | NR               | 515       | 26492            | NR               | 645       | 96365            | NR               | 775       | 5000             | NR               | 905       | 2067             | NR               |
| 390       | 1541             | NR               | 520       | 32294            | NR               | 650       | 88651            | NR               | 780       | 4709             | NR               | 910       | 1959             | NR               |
| 395       | 1355             | NR               | 525       | 38123            | NR               | 655       | 81152            | NR               | 785       | 4305             | NR               | 915       | 1874             | NR               |
| 400       | 1243             | NR               | 530       | 43232            | NR               | 660       | 73523            | NR               | 790       | 4040             | NR               | 920       | 1484             | NR               |
| 405       | 1417             | NR               | 535       | 48012            | NR               | 665       | 66123            | NR               | 795       | 3642             | NR               | 925       | 1914             | NR               |
| 410       | 2147             | NR               | 540       | 52623            | NR               | 670       | 58677            | NR               | 800       | 3594             | NR               | 930       | 1948             | NR               |
| 415       | 3837             | NR               | 545       | 57516            | NR               | 675       | 52349            | NR               | 805       | 3190             | NR               | 935       | 2079             | NR               |
| 420       | 7159             | NR               | 550       | 62613            | NR               | 680       | 46159            | NR               | 810       | 3241             | NR               | 940       | 2263             | NR               |
| 425       | 12599            | NR               | 555       | 68554            | NR               | 685       | 40525            | NR               | 815       | 2732             | NR               | 945       | 1688             | NR               |
| 430       | 19019            | NR               | 560       | 75325            | NR               | 690       | 35615            | NR               | 820       | 2612             | NR               | 950       | 1560             | NR               |
| 435       | 24875            | NR               | 565       | 82533            | NR               | 695       | 31158            | NR               | 825       | 2966             | NR               | 955       | 2826             | NR               |
| 440       | 29103            | NR               | 570       | 90909            | NR               | 700       | 27409            | NR               | 830       | 2574             | NR               | 960       | 1477             | NR               |
| 445       | 29901            | NR               | 575       | 99621            | NR               | 705       | 24204            | NR               | 835       | 2633             | NR               | 965       | 1568             | NR               |
| 450       | 24862            | NR               | 580       | 108484           | NR               | 710       | 21558            | NR               | 840       | 2526             | NR               | 970       | 2030             | NR               |
| 455       | 15942            | NR               | 585       | 116679           | NR               | 715       | 19222            | NR               | 845       | 2631             | NR               | 975       | 1986             | NR               |
| 460       | 9916             | NR               | 590       | 123752           | NR               | 720       | 17310            | NR               | 850       | 2079             | NR               | 980       | 2540             | NR               |
| 465       | 7051             | NR               | 595       | 129324           | NR               | 725       | 15280            | NR               | 855       | 2309             | NR               | 985       | 1139             | NR               |
| 470       | 5227             | NR               | 600       | 134082           | NR               | 730       | 13282            | NR               | 860       | 2528             | NR               | 990       | 2018             | NR               |
| 475       | 4257             | NR               | 605       | 135698           | NR               | 735       | 11753            | NR               | 865       | 2121             | NR               | 995       | 3445             | NR               |
| 480       | 4052             | NR               | 610       | 135144           | NR               | 740       | 10654            | NR               | 870       | 2751             | NR               | 1000      | 3704             | NR               |
| 485       | 4298             | NR               | 615       | 134180           | NR               | 745       | 9451             | NR               | 875       | 2317             | NR               |           |                  |                  |

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### Summary

$R_f = 69.8$   
 $R_g = 99.2$   
 CIE  $R_a = 72.0$   
 $R_g = -17.4$



### Color Vector Graphics



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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 87 | CES26 = 56 | CES51 = 74 | CES76 = 56 |
| CES02 = 65 | CES27 = 76 | CES52 = 76 | CES77 = 81 |
| CES03 = 32 | CES28 = 83 | CES53 = 65 | CES78 = 63 |
| CES04 = 72 | CES29 = 46 | CES54 = 78 | CES79 = 84 |
| CES05 = 52 | CES30 = 48 | CES55 = 75 | CES80 = 84 |
| CES06 = 52 | CES31 = 51 | CES56 = 65 | CES81 = 63 |
| CES07 = 44 | CES32 = 51 | CES57 = 62 | CES82 = 92 |
| CES08 = 42 | CES33 = 53 | CES58 = 66 | CES83 = 83 |
| CES09 = 29 | CES34 = 70 | CES59 = 84 | CES84 = 92 |
| CES10 = 78 | CES35 = 85 | CES60 = 90 | CES85 = 81 |
| CES11 = 61 | CES36 = 78 | CES61 = 84 | CES86 = 56 |
| CES12 = 68 | CES37 = 80 | CES62 = 70 | CES87 = 78 |
| CES13 = 45 | CES38 = 53 | CES63 = 68 | CES88 = 72 |
| CES14 = 75 | CES39 = 90 | CES64 = 69 | CES89 = 62 |
| CES15 = 72 | CES40 = 84 | CES65 = 67 | CES90 = 67 |
| CES16 = 49 | CES41 = 75 | CES66 = 64 | CES91 = 90 |
| CES17 = 51 | CES42 = 79 | CES67 = 63 | CES92 = 67 |
| CES18 = 57 | CES43 = 64 | CES68 = 69 | CES93 = 79 |
| CES19 = 74 | CES44 = 98 | CES69 = 80 | CES94 = 52 |
| CES20 = 68 | CES45 = 73 | CES70 = 63 | CES95 = 76 |
| CES21 = 89 | CES46 = 67 | CES71 = 63 | CES96 = 78 |
| CES22 = 81 | CES47 = 60 | CES72 = 87 | CES97 = 77 |
| CES23 = 92 | CES48 = 48 | CES73 = 56 | CES98 = 71 |
| CES24 = 92 | CES49 = 64 | CES74 = 87 | CES99 = 65 |
| CES25 = 74 | CES50 = 74 | CES75 = 66 |            |



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Color Rendition by Hue-Angle Bin



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**Measure Comparisons**



(END OF REPORT)