

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: P323794

Luminaire Tested: **GLEON-SA0A-730-U-SL4-HSS**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P323794  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-25)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA0A-730-U-SL4-HSS  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(10) 70 CRI, 3000K, 615mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE IV  
SPILL LIGHT ELIMINATOR OPTICS WITH HOUSE SIDE SHIELD  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 34092 lumens  
Efficiency: N/A  
Efficacy: 105.5 lumens/watt  
Luminous Opening: Rectangular (W 2.5' x L: 1' x H: 0')  
IES Classification: Type IV - Short  
BUG Rating: B3 - U0 - G5

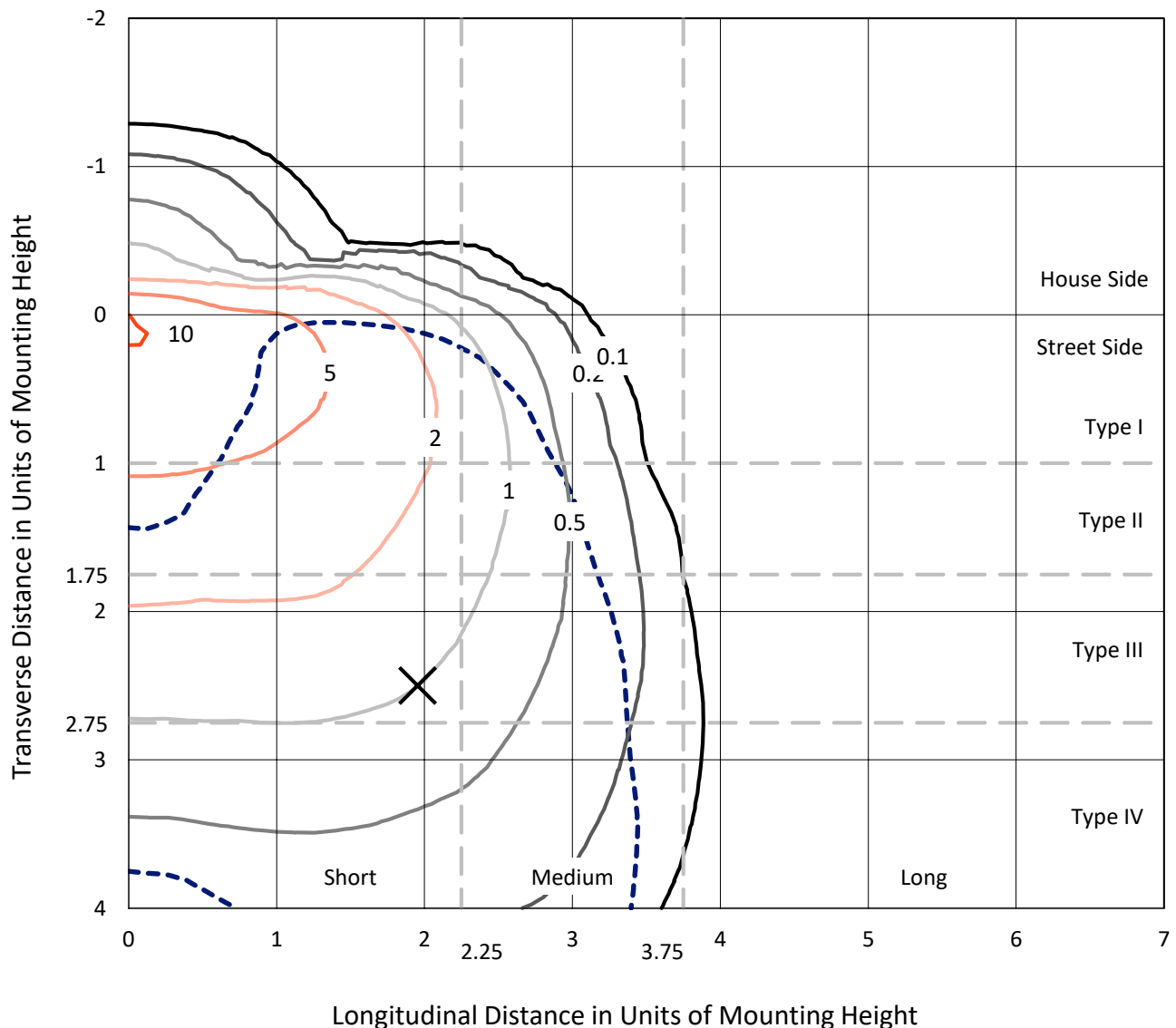
Input Watts (W): 323  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



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## Iso-Footcandle Lines of Horizontal Illumination

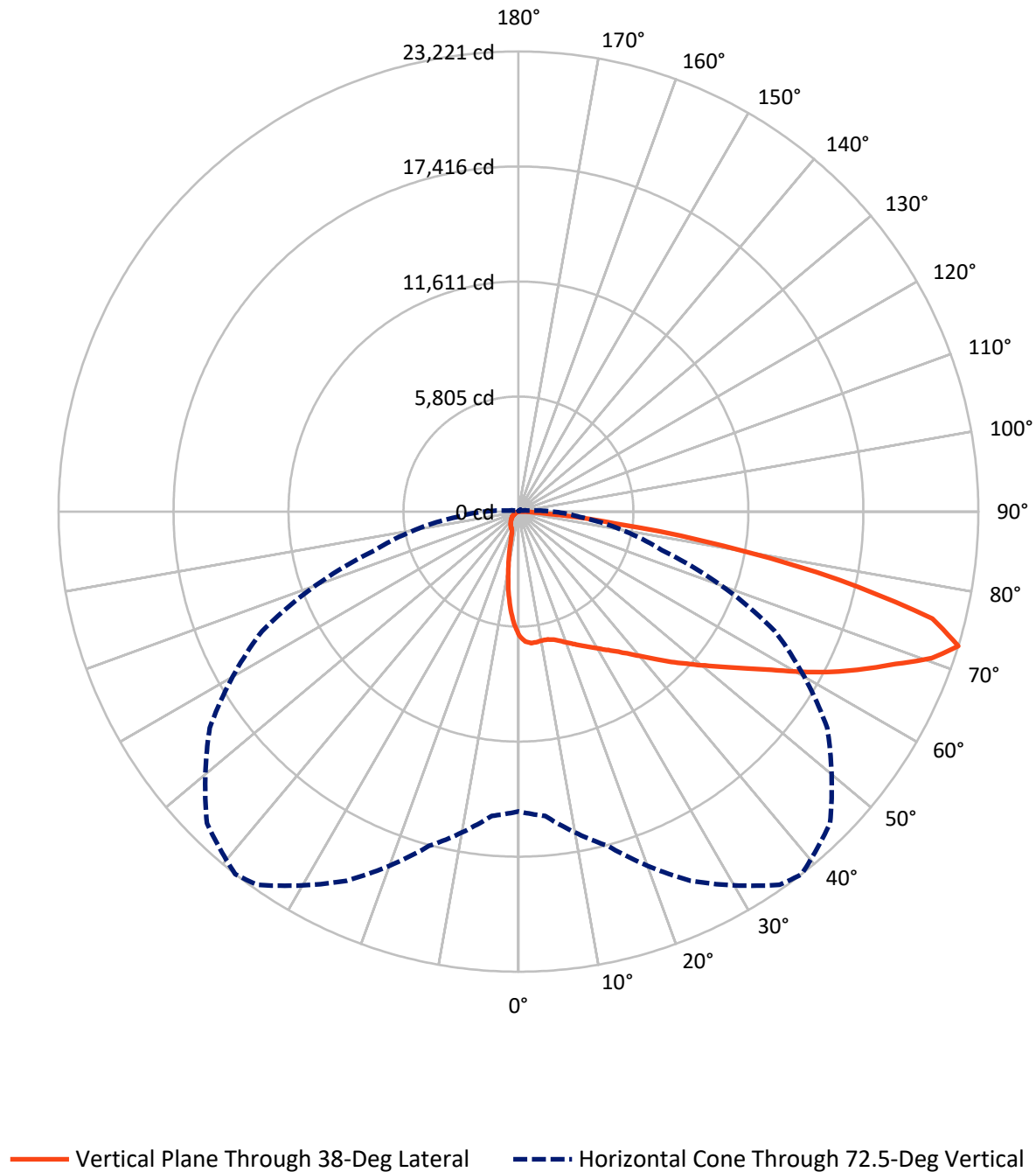
× Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 10.6 fc  
 Type IV - Short - N/A

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## Luminous Intensity Polar Plot



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**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 2869.0   | 0.0    | 2869.0  |
|                    | % Fixture | 8.4      | 0.0    | 8.4     |
| <b>Street Side</b> | Lumens    | 31223.0  | 0.0    | 31223.0 |
|                    | % Fixture | 91.6     | 0.0    | 91.6    |
| <b>Total</b>       | Lumens    | 34092.0  | 0.0    | 34092.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 534.3   | 1.6       |
| 10°-20°   | 1306.4  | 3.8       |
| 20°-30°   | 2077.8  | 6.1       |
| 30°-40°   | 3123.8  | 9.2       |
| 40°-50°   | 4765.6  | 14.0      |
| 50°-60°   | 6735.4  | 19.8      |
| 60°-70°   | 8448.4  | 24.8      |
| 70°-80°   | 6317.0  | 18.5      |
| 80°-90°   | 783.3   | 2.3       |
| 90°-100°  | 0.0     | 0.0       |
| 100°-110° | 0.0     | 0.0       |
| 110°-120° | 0.0     | 0.0       |
| 120°-130° | 0.0     | 0.0       |
| 130°-140° | 0.0     | 0.0       |
| 140°-150° | 0.0     | 0.0       |
| 150°-160° | 0.0     | 0.0       |
| 160°-170° | 0.0     | 0.0       |
| 170°-180° | 0.0     | 0.0       |
| 0°-90°    | 34092.0 | 100.0     |
| 0°-180°   | 34092.0 | 100.0     |

**Coefficient of Utilization**



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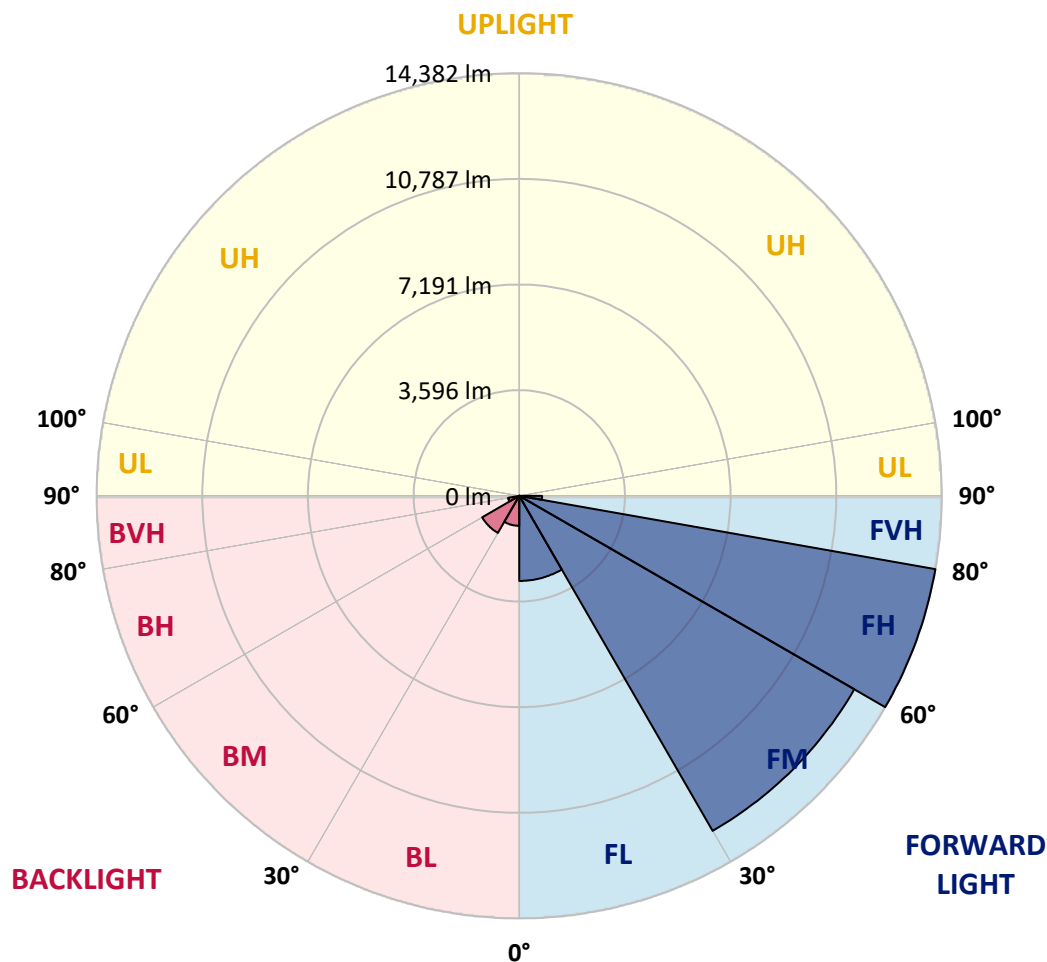
CATALOG NUMBER: GLEON-SA0A-730-U-SL4-HSS

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

| Zone |             | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |        |
|------|-------------|---------|-----------|-------------------------|------|--------|
|      |             |         |           | B                       | U    | G      |
| FL   | (0°-30°)    | 2897.0  | 8.5       |                         |      |        |
| FM   | (30°-60°)   | 13167.8 | 38.6      |                         |      |        |
| FH   | (60°-80°)   | 14382.2 | 42.2      |                         |      | G5     |
| FVH  | (80°-90°)   | 776.0   | 2.3       |                         |      | G5     |
| BL   | (0°-30°)    | 1021.5  | 3.0       | B3/2500                 |      |        |
| BM   | (30°-60°)   | 1456.9  | 4.3       | B2/2500                 |      |        |
| BH   | (60°-80°)   | 383.2   | 1.1       | B1/500                  |      | G1/500 |
| BVH  | (80°-90°)   | 7.3     | 0.0       |                         |      | G0/10  |
| UL   | (90°-100°)  | 0.0     | 0.0       |                         | U0/0 |        |
| UH   | (100°-180°) | 0.0     | 0.0       |                         | U0/0 |        |

**BUG Rating: B3-U0-G5**

Type IV Short





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 38°     | 45°     | 55°     | 65°     | 75°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 6269.4  | 6269.4  | 6269.4  | 6269.4  | 6269.4  | 6269.4  | 6269.4  | 6269.4  | 6269.4  | 6269.4  | 6269.4  |
| 2.5°  | 6654.5  | 6655.9  | 6640.4  | 6614.9  | 6582.3  | 6565.3  | 6537.0  | 6491.7  | 6443.6  | 6357.2  | 6263.7  |
| 5°    | 6790.4  | 6790.4  | 6770.6  | 6736.6  | 6684.3  | 6668.7  | 6614.9  | 6542.7  | 6443.6  | 6303.4  | 6146.2  |
| 7.5°  | 6776.3  | 6779.1  | 6752.2  | 6716.8  | 6664.4  | 6650.3  | 6585.1  | 6504.4  | 6381.3  | 6211.4  | 6010.3  |
| 10°   | 6702.7  | 6709.7  | 6688.5  | 6671.5  | 6623.4  | 6607.8  | 6546.9  | 6466.2  | 6343.0  | 6161.8  | 5931.0  |
| 12.5° | 6627.6  | 6634.7  | 6641.8  | 6657.4  | 6627.6  | 6622.0  | 6573.8  | 6505.9  | 6388.3  | 6200.0  | 5939.5  |
| 15°   | 6579.5  | 6593.6  | 6644.6  | 6705.5  | 6712.6  | 6706.9  | 6675.8  | 6612.0  | 6493.1  | 6297.7  | 6000.4  |
| 17.5° | 6579.5  | 6602.1  | 6708.3  | 6824.4  | 6865.5  | 6869.7  | 6842.8  | 6753.6  | 6612.0  | 6402.5  | 6057.0  |
| 20°   | 6634.7  | 6665.8  | 6831.5  | 6995.7  | 7063.7  | 7063.7  | 7011.3  | 6886.7  | 6721.1  | 6497.4  | 6095.3  |
| 22.5° | 6776.3  | 6817.3  | 7025.5  | 7215.2  | 7287.4  | 7271.8  | 7201.0  | 7019.8  | 6834.3  | 6605.0  | 6143.4  |
| 25°   | 7055.2  | 7086.4  | 7303.0  | 7494.1  | 7538.0  | 7502.6  | 7413.4  | 7181.2  | 6978.7  | 6750.8  | 6231.2  |
| 27.5° | 7414.8  | 7419.1  | 7642.8  | 7804.2  | 7777.3  | 7753.2  | 7641.4  | 7383.7  | 7186.9  | 6958.9  | 6382.7  |
| 30°   | 7809.9  | 7809.9  | 8006.7  | 8129.8  | 8047.7  | 8027.9  | 7916.0  | 7628.6  | 7453.1  | 7242.1  | 6597.9  |
| 32.5° | 8192.1  | 8209.1  | 8369.1  | 8447.0  | 8355.0  | 8335.1  | 8226.1  | 7938.7  | 7807.0  | 7673.9  | 6933.4  |
| 35°   | 8561.7  | 8574.4  | 8725.9  | 8768.4  | 8680.6  | 8686.3  | 8608.4  | 8364.9  | 8315.3  | 8298.3  | 7438.9  |
| 37.5° | 8919.9  | 8922.7  | 9077.0  | 9103.9  | 9060.1  | 9108.2  | 9115.3  | 8900.1  | 8992.1  | 9129.4  | 8151.1  |
| 40°   | 9246.9  | 9249.8  | 9402.7  | 9472.1  | 9547.1  | 9609.4  | 9664.6  | 9549.9  | 9854.4  | 10172.9 | 8999.2  |
| 42.5° | 9508.9  | 9538.6  | 9732.6  | 9864.3  | 10062.5 | 10181.4 | 10331.5 | 10325.8 | 10880.8 | 11359.4 | 10024.3 |
| 45°   | 9739.7  | 9790.6  | 10061.1 | 10291.9 | 10631.7 | 10821.4 | 11056.4 | 11240.5 | 12036.2 | 12680.4 | 11062.1 |
| 47.5° | 10044.1 | 10092.2 | 10400.9 | 10778.9 | 11232.0 | 11481.2 | 11870.5 | 12268.4 | 13306.2 | 13977.3 | 12075.8 |
| 50°   | 10473.1 | 10451.8 | 10756.3 | 11298.5 | 11880.4 | 12207.5 | 12762.5 | 13358.6 | 14566.3 | 15107.2 | 12671.9 |
| 52.5° | 10930.4 | 10921.9 | 11147.0 | 11863.4 | 12645.0 | 13027.3 | 13760.7 | 14485.6 | 15771.2 | 15885.9 | 12945.2 |
| 55°   | 11496.7 | 11435.9 | 11625.6 | 12507.7 | 13552.6 | 13963.2 | 14826.8 | 15601.3 | 16731.2 | 16324.8 | 13082.5 |
| 57.5° | 12090.0 | 11989.5 | 12170.7 | 13225.5 | 14576.2 | 15061.9 | 16007.7 | 16688.7 | 17369.7 | 16625.0 | 13081.1 |
| 60°   | 12703.1 | 12584.1 | 12799.3 | 14123.2 | 15847.7 | 16409.8 | 17287.6 | 17423.5 | 17965.8 | 16776.5 | 12984.8 |
| 62.5° | 13215.6 | 13144.8 | 13464.8 | 15083.1 | 17267.8 | 17820.0 | 18254.6 | 18091.8 | 18468.4 | 16894.0 | 12759.7 |
| 65°   | 13757.9 | 13762.1 | 14278.9 | 16203.0 | 18777.1 | 19149.4 | 19186.3 | 18958.3 | 18888.9 | 16869.9 | 11998.0 |
| 67.5° | 14491.3 | 14559.2 | 15421.5 | 17723.7 | 20245.3 | 20532.7 | 20529.9 | 19897.0 | 19196.2 | 15912.8 | 10308.8 |
| 70°   | 15267.2 | 15427.2 | 16738.2 | 19463.8 | 21848.1 | 22139.7 | 21989.6 | 20494.5 | 18074.8 | 12867.3 | 7295.9  |
| 72.5° | 15136.9 | 15414.4 | 17470.2 | 20561.0 | 22999.2 | 23221.4 | 22245.9 | 19026.3 | 14286.0 | 7478.5  | 3106.4  |
| 75°   | 11678.0 | 11999.4 | 16019.0 | 19473.7 | 21791.4 | 21591.8 | 19114.0 | 14805.6 | 7807.0  | 2087.0  | 699.4   |
| 77.5° | 6168.9  | 6340.2  | 10582.1 | 14835.3 | 16991.7 | 16574.0 | 13464.8 | 8213.4  | 2380.1  | 516.8   | 314.3   |
| 80°   | 3231.0  | 3270.6  | 4611.4  | 8417.3  | 10487.2 | 10490.1 | 7979.8  | 3607.6  | 981.2   | 264.8   | 211.0   |
| 82.5° | 1730.2  | 1764.2  | 2436.7  | 3889.4  | 5494.9  | 4981.0  | 3055.4  | 1985.0  | 570.6   | 150.1   | 202.5   |
| 85°   | 416.3   | 423.3   | 1381.9  | 1776.9  | 2160.6  | 1543.3  | 907.6   | 1666.5  | 154.3   | 87.8    | 164.2   |
| 87.5° | 160.0   | 162.8   | 512.5   | 768.8   | 550.8   | 356.8   | 424.8   | 621.6   | 19.8    | 34.0    | 25.5    |
| 90°   | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |



REPORT NUMBER: P323794

CATALOG NUMBER: GLEON-SA0A-730-U-SL4-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°     | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 6269.4  | 6269.4 | 6269.4 | 6269.4 | 6269.4 | 6269.4 | 6269.4 | 6269.4 | 6269.4 | 6269.4 | 6269.4 |
| 2.5°  | 6207.1  | 6170.3 | 6079.7 | 5965.0 | 5863.1 | 5789.4 | 5679.0 | 5606.8 | 5558.6 | 5557.2 | 5538.8 |
| 5°    | 6049.9  | 5974.9 | 5779.5 | 5547.3 | 5336.4 | 5146.6 | 4922.9 | 4745.9 | 4614.3 | 4593.0 | 4547.7 |
| 7.5°  | 5881.5  | 5758.3 | 5458.1 | 5095.7 | 4741.7 | 4382.1 | 3964.4 | 3705.3 | 3483.0 | 3376.8 | 3365.5 |
| 10°   | 5778.1  | 5605.4 | 5179.2 | 4655.3 | 4100.3 | 3515.6 | 2969.0 | 2591.0 | 2317.8 | 2239.9 | 2181.8 |
| 12.5° | 5756.9  | 5528.9 | 4964.0 | 4241.9 | 3449.0 | 2676.0 | 2071.4 | 1669.3 | 1451.3 | 1381.9 | 1363.5 |
| 15°   | 5778.1  | 5493.5 | 4782.8 | 3832.7 | 2789.2 | 1898.7 | 1390.4 | 1156.8 | 1074.6 | 1054.8 | 1053.4 |
| 17.5° | 5790.8  | 5451.0 | 4577.5 | 3378.2 | 2149.3 | 1356.4 | 1064.7 | 996.8  | 984.0  | 982.6  | 985.4  |
| 20°   | 5789.4  | 5385.9 | 4332.5 | 2871.4 | 1598.5 | 1066.1 | 962.8  | 948.6  | 945.8  | 947.2  | 945.8  |
| 22.5° | 5779.5  | 5309.5 | 4063.5 | 2348.9 | 1207.7 | 952.9  | 918.9  | 910.4  | 909.0  | 909.0  | 909.0  |
| 25°   | 5797.9  | 5248.6 | 3767.6 | 1849.1 | 995.3  | 900.5  | 879.2  | 872.2  | 870.8  | 870.8  | 867.9  |
| 27.5° | 5864.5  | 5214.6 | 3443.4 | 1422.9 | 899.1  | 853.8  | 836.8  | 835.4  | 831.1  | 829.7  | 832.5  |
| 30°   | 5972.1  | 5214.6 | 3088.0 | 1107.2 | 841.0  | 805.6  | 792.9  | 790.0  | 788.6  | 787.2  | 788.6  |
| 32.5° | 6161.8  | 5254.2 | 2700.0 | 920.3  | 785.8  | 751.8  | 743.3  | 747.6  | 743.3  | 743.3  | 743.3  |
| 35°   | 6504.4  | 5373.2 | 2293.7 | 802.8  | 727.7  | 699.4  | 690.9  | 696.6  | 693.8  | 693.8  | 692.4  |
| 37.5° | 7004.2  | 5594.0 | 1884.5 | 732.0  | 676.8  | 647.0  | 635.7  | 644.2  | 641.4  | 641.4  | 640.0  |
| 40°   | 7613.1  | 5915.4 | 1495.1 | 678.2  | 627.2  | 596.1  | 586.2  | 590.4  | 583.3  | 583.3  | 586.2  |
| 42.5° | 8364.9  | 6323.2 | 1155.3 | 625.8  | 577.7  | 547.9  | 542.3  | 538.0  | 525.3  | 518.2  | 519.6  |
| 45°   | 9200.2  | 6748.0 | 900.5  | 574.8  | 530.9  | 506.9  | 498.4  | 487.1  | 465.8  | 451.7  | 453.1  |
| 47.5° | 9946.4  | 7075.0 | 732.0  | 525.3  | 488.5  | 470.1  | 457.3  | 436.1  | 404.9  | 387.9  | 389.4  |
| 50°   | 10338.6 | 7124.6 | 623.0  | 475.7  | 448.8  | 430.4  | 412.0  | 379.4  | 342.6  | 324.2  | 322.8  |
| 52.5° | 10439.1 | 6892.4 | 542.3  | 430.4  | 409.2  | 387.9  | 363.9  | 320.0  | 278.9  | 259.1  | 256.3  |
| 55°   | 10475.9 | 6538.4 | 470.1  | 387.9  | 366.7  | 342.6  | 311.5  | 261.9  | 223.7  | 203.9  | 202.5  |
| 57.5° | 10354.1 | 6010.3 | 413.4  | 349.7  | 324.2  | 294.5  | 256.3  | 209.5  | 172.7  | 157.2  | 157.2  |
| 60°   | 10083.7 | 5295.3 | 369.5  | 308.7  | 280.3  | 246.4  | 206.7  | 162.8  | 128.8  | 116.1  | 116.1  |
| 62.5° | 9544.3  | 4369.3 | 328.5  | 266.2  | 239.3  | 203.9  | 167.1  | 123.2  | 90.6   | 83.5   | 85.0   |
| 65°   | 8526.3  | 3314.5 | 287.4  | 228.0  | 203.9  | 168.5  | 130.3  | 87.8   | 60.9   | 60.9   | 63.7   |
| 67.5° | 6953.3  | 2302.2 | 244.9  | 194.0  | 175.6  | 137.3  | 99.1   | 60.9   | 42.5   | 48.1   | 53.8   |
| 70°   | 4602.9  | 1291.3 | 209.5  | 160.0  | 150.1  | 109.0  | 73.6   | 41.1   | 34.0   | 45.3   | 55.2   |
| 72.5° | 1737.3  | 502.6  | 175.6  | 128.8  | 130.3  | 83.5   | 52.4   | 31.1   | 31.1   | 49.6   | 65.1   |
| 75°   | 484.2   | 246.4  | 126.0  | 94.9   | 101.9  | 60.9   | 38.2   | 26.9   | 29.7   | 56.6   | 76.5   |
| 77.5° | 284.6   | 181.2  | 82.1   | 55.2   | 69.4   | 42.5   | 25.5   | 21.2   | 25.5   | 48.1   | 73.6   |
| 80°   | 229.4   | 96.3   | 48.1   | 28.3   | 38.2   | 24.1   | 17.0   | 12.7   | 7.1    | 18.4   | 38.2   |
| 82.5° | 229.4   | 58.1   | 22.7   | 19.8   | 19.8   | 12.7   | 8.5    | 5.7    | 1.4    | 0.0    | 9.9    |
| 85°   | 154.3   | 24.1   | 14.2   | 12.7   | 9.9    | 4.2    | 2.8    | 1.4    | 0.0    | 0.0    | 0.0    |
| 87.5° | 25.5    | 9.9    | 5.7    | 2.8    | 1.4    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 90°   | 0.0     | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

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

Report Prepared for

Cooper Lighting Solutions

McGRAW-EDISON

Report Number: SP1-1908-441-2-R4

Test Date: 10/03/2019

Luminaire Tested: SA1C-730-U-5WQ

Data in this report applies to families of products SA1C-730-U-5WQ .

### Test Information

Test Method: LM-79-2008  
Report Number: SP1-1908-441-2-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-730-U-5WQ**  
Description: MCGRAW EDISON ROADWAY AND AREA LUMINAIRE

\*\*\*THIS IS A REVISION OF SP1-1908-441-2-R3. TO UPDATE THE CATALOG INFORMATION.\*\*\*TESTED IN SITU. (1) 70 CRI, 3000K, 1050MA LIGHTSQUARE WITH 16 LEDS AND TYPE V WIDE OPTICS.

### Spectral Parameters

|                           |        |           |      |      |       |
|---------------------------|--------|-----------|------|------|-------|
| CCT (K):                  | 2993   | CRI (Ra): | 71.8 |      |       |
| CIE u':                   | 0.2508 | R1:       | 67.5 | R9:  | -38.3 |
| CIE v':                   | 0.5215 | R2:       | 82.9 | R10: | 62.5  |
| Duv:                      | 0.0000 | R3:       | 94.7 | R11: | 63.7  |
| CIE x:                    | 0.4374 | R4:       | 67.7 | R12: | 57.8  |
| CIE y:                    | 0.4043 | R5:       | 67.9 | R13: | 70.4  |
| CIE z:                    | 0.1583 | R6:       | 77.6 | R14: | 97.3  |
| Peak Wavelength (nm):     | 593    | R7:       | 76.0 |      |       |
| Dominant Wavelength (nm): | 582    | R8:       | 40.5 |      |       |
| Purity:                   | 53     |           |      |      |       |
| Rf:                       | 75.7   |           |      |      |       |
| Rg:                       | 93.9   |           |      |      |       |



### Test Conditions

Stabilization Time: 53M  
Operation Time: 12H  
Room Temperature (°C) / RH%: 25.0./44%  
Sphere Temperature (°C): 25.7

REPORT NUMBER: SP1-1908-441-2-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 3000K 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       | 2397             | NR               | 490       | 24908            | NR               | 620       | 118784           | NR               | 750       | 5037             | NR               | 880       | 2677             | NR               |
| 365       | 2084             | NR               | 495       | 30998            | NR               | 625       | 108951           | NR               | 755       | 4413             | NR               | 885       | 2940             | NR               |
| 370       | 2143             | NR               | 500       | 37103            | NR               | 630       | 99573            | NR               | 760       | 4189             | NR               | 890       | 3116             | NR               |
| 375       | 2413             | NR               | 505       | 42987            | NR               | 635       | 90444            | NR               | 765       | 3677             | NR               | 895       | 3345             | NR               |
| 380       | 2172             | NR               | 510       | 48702            | NR               | 640       | 80749            | NR               | 770       | 3366             | NR               | 900       | 2312             | NR               |
| 385       | 1997             | NR               | 515       | 53741            | NR               | 645       | 71664            | NR               | 775       | 3211             | NR               | 905       | 2829             | NR               |
| 390       | 1830             | NR               | 520       | 57283            | NR               | 650       | 63936            | NR               | 780       | 2682             | NR               | 910       | 2783             | NR               |
| 395       | 1861             | NR               | 525       | 61876            | NR               | 655       | 56611            | NR               | 785       | 2804             | NR               | 915       | 2662             | NR               |
| 400       | 1717             | NR               | 530       | 65398            | NR               | 660       | 49763            | NR               | 790       | 2581             | NR               | 920       | 3047             | NR               |
| 405       | 1761             | NR               | 535       | 69597            | NR               | 665       | 42891            | NR               | 795       | 2711             | NR               | 925       | 2256             | NR               |
| 410       | 2680             | NR               | 540       | 74214            | NR               | 670       | 36939            | NR               | 800       | 2609             | NR               | 930       | 2976             | NR               |
| 415       | 4374             | NR               | 545       | 79911            | NR               | 675       | 31946            | NR               | 805       | 2581             | NR               | 935       | 3503             | NR               |
| 420       | 8071             | NR               | 550       | 86153            | NR               | 680       | 27385            | NR               | 810       | 2404             | NR               | 940       | 4226             | NR               |
| 425       | 15169            | NR               | 555       | 93952            | NR               | 685       | 23504            | NR               | 815       | 2556             | NR               | 945       | 2930             | NR               |
| 430       | 26038            | NR               | 560       | 102904           | NR               | 690       | 20210            | NR               | 820       | 2742             | NR               | 950       | 2115             | NR               |
| 435       | 41316            | NR               | 565       | 112009           | NR               | 695       | 17459            | NR               | 825       | 2014             | NR               | 955       | 2634             | NR               |
| 440       | 59674            | NR               | 570       | 121662           | NR               | 700       | 15207            | NR               | 830       | 2488             | NR               | 960       | 4200             | NR               |
| 445       | 72751            | NR               | 575       | 130476           | NR               | 705       | 13322            | NR               | 835       | 2625             | NR               | 965       | 1982             | NR               |
| 450       | 65091            | NR               | 580       | 137926           | NR               | 710       | 11676            | NR               | 840       | 2754             | NR               | 970       | 3613             | NR               |
| 455       | 44894            | NR               | 585       | 143406           | NR               | 715       | 10626            | NR               | 845       | 2708             | NR               | 975       | 4034             | NR               |
| 460       | 32712            | NR               | 590       | 147039           | NR               | 720       | 9416             | NR               | 850       | 2608             | NR               | 980       | 3922             | NR               |
| 465       | 25296            | NR               | 595       | 147365           | NR               | 725       | 8333             | NR               | 855       | 2605             | NR               | 985       | 1909             | NR               |
| 470       | 19318            | NR               | 600       | 145800           | NR               | 730       | 7134             | NR               | 860       | 1765             | NR               | 990       | 3617             | NR               |
| 475       | 17265            | NR               | 605       | 141363           | NR               | 735       | 6437             | NR               | 865       | 2581             | NR               | 995       | 4767             | NR               |
| 480       | 18260            | NR               | 610       | 134199           | NR               | 740       | 5834             | NR               | 870       | 3016             | NR               | 1000      | 2528             | NR               |
| 485       | 20845            | NR               | 615       | 127683           | NR               | 745       | 5500             | NR               | 875       | 3952             | NR               |           |                  |                  |

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**Scotopic Flux vs. Wavelength**



**Scotopic Lumens: 8494.8**

**S/P: 1.23**

| 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       | 2397             | NR               | 490       | 24908            | NR               | 620       | 118784           | NR               | 750       | 5037             | NR               | 880       | 2677             | NR               |
| 365       | 2084             | NR               | 495       | 30998            | NR               | 625       | 108951           | NR               | 755       | 4413             | NR               | 885       | 2940             | NR               |
| 370       | 2143             | NR               | 500       | 37103            | NR               | 630       | 99573            | NR               | 760       | 4189             | NR               | 890       | 3116             | NR               |
| 375       | 2413             | NR               | 505       | 42987            | NR               | 635       | 90444            | NR               | 765       | 3677             | NR               | 895       | 3345             | NR               |
| 380       | 2172             | NR               | 510       | 48702            | NR               | 640       | 80749            | NR               | 770       | 3366             | NR               | 900       | 2312             | NR               |
| 385       | 1997             | NR               | 515       | 53741            | NR               | 645       | 71664            | NR               | 775       | 3211             | NR               | 905       | 2829             | NR               |
| 390       | 1830             | NR               | 520       | 57283            | NR               | 650       | 63936            | NR               | 780       | 2682             | NR               | 910       | 2783             | NR               |
| 395       | 1861             | NR               | 525       | 61876            | NR               | 655       | 56611            | NR               | 785       | 2804             | NR               | 915       | 2662             | NR               |
| 400       | 1717             | NR               | 530       | 65398            | NR               | 660       | 49763            | NR               | 790       | 2581             | NR               | 920       | 3047             | NR               |
| 405       | 1761             | NR               | 535       | 69597            | NR               | 665       | 42891            | NR               | 795       | 2711             | NR               | 925       | 2256             | NR               |
| 410       | 2680             | NR               | 540       | 74214            | NR               | 670       | 36939            | NR               | 800       | 2609             | NR               | 930       | 2976             | NR               |
| 415       | 4374             | NR               | 545       | 79911            | NR               | 675       | 31946            | NR               | 805       | 2581             | NR               | 935       | 3503             | NR               |
| 420       | 8071             | NR               | 550       | 86153            | NR               | 680       | 27385            | NR               | 810       | 2404             | NR               | 940       | 4226             | NR               |
| 425       | 15169            | NR               | 555       | 93952            | NR               | 685       | 23504            | NR               | 815       | 2556             | NR               | 945       | 2930             | NR               |
| 430       | 26038            | NR               | 560       | 102904           | NR               | 690       | 20210            | NR               | 820       | 2742             | NR               | 950       | 2115             | NR               |
| 435       | 41316            | NR               | 565       | 112009           | NR               | 695       | 17459            | NR               | 825       | 2014             | NR               | 955       | 2634             | NR               |
| 440       | 59674            | NR               | 570       | 121662           | NR               | 700       | 15207            | NR               | 830       | 2488             | NR               | 960       | 4200             | NR               |
| 445       | 72751            | NR               | 575       | 130476           | NR               | 705       | 13322            | NR               | 835       | 2625             | NR               | 965       | 1982             | NR               |
| 450       | 65091            | NR               | 580       | 137926           | NR               | 710       | 11676            | NR               | 840       | 2754             | NR               | 970       | 3613             | NR               |
| 455       | 44894            | NR               | 585       | 143406           | NR               | 715       | 10626            | NR               | 845       | 2708             | NR               | 975       | 4034             | NR               |
| 460       | 32712            | NR               | 590       | 147039           | NR               | 720       | 9416             | NR               | 850       | 2608             | NR               | 980       | 3922             | NR               |
| 465       | 25296            | NR               | 595       | 147365           | NR               | 725       | 8333             | NR               | 855       | 2605             | NR               | 985       | 1909             | NR               |
| 470       | 19318            | NR               | 600       | 145800           | NR               | 730       | 7134             | NR               | 860       | 1765             | NR               | 990       | 3617             | NR               |
| 475       | 17265            | NR               | 605       | 141363           | NR               | 735       | 6437             | NR               | 865       | 2581             | NR               | 995       | 4767             | NR               |
| 480       | 18260            | NR               | 610       | 134199           | NR               | 740       | 5834             | NR               | 870       | 3016             | NR               | 1000      | 2528             | NR               |
| 485       | 20845            | NR               | 615       | 127683           | NR               | 745       | 5500             | NR               | 875       | 3952             | NR               |           |                  |                  |

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**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: 3101.5 M/P: 0.45**

| 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       | 2397             | NR               | 490       | 24908            | NR               | 620       | 118784           | NR               | 750       | 5037             | NR               | 880       | 2677             | NR               |
| 365       | 2084             | NR               | 495       | 30998            | NR               | 625       | 108951           | NR               | 755       | 4413             | NR               | 885       | 2940             | NR               |
| 370       | 2143             | NR               | 500       | 37103            | NR               | 630       | 99573            | NR               | 760       | 4189             | NR               | 890       | 3116             | NR               |
| 375       | 2413             | NR               | 505       | 42987            | NR               | 635       | 90444            | NR               | 765       | 3677             | NR               | 895       | 3345             | NR               |
| 380       | 2172             | NR               | 510       | 48702            | NR               | 640       | 80749            | NR               | 770       | 3366             | NR               | 900       | 2312             | NR               |
| 385       | 1997             | NR               | 515       | 53741            | NR               | 645       | 71664            | NR               | 775       | 3211             | NR               | 905       | 2829             | NR               |
| 390       | 1830             | NR               | 520       | 57283            | NR               | 650       | 63936            | NR               | 780       | 2682             | NR               | 910       | 2783             | NR               |
| 395       | 1861             | NR               | 525       | 61876            | NR               | 655       | 56611            | NR               | 785       | 2804             | NR               | 915       | 2662             | NR               |
| 400       | 1717             | NR               | 530       | 65398            | NR               | 660       | 49763            | NR               | 790       | 2581             | NR               | 920       | 3047             | NR               |
| 405       | 1761             | NR               | 535       | 69597            | NR               | 665       | 42891            | NR               | 795       | 2711             | NR               | 925       | 2256             | NR               |
| 410       | 2680             | NR               | 540       | 74214            | NR               | 670       | 36939            | NR               | 800       | 2609             | NR               | 930       | 2976             | NR               |
| 415       | 4374             | NR               | 545       | 79911            | NR               | 675       | 31946            | NR               | 805       | 2581             | NR               | 935       | 3503             | NR               |
| 420       | 8071             | NR               | 550       | 86153            | NR               | 680       | 27385            | NR               | 810       | 2404             | NR               | 940       | 4226             | NR               |
| 425       | 15169            | NR               | 555       | 93952            | NR               | 685       | 23504            | NR               | 815       | 2556             | NR               | 945       | 2930             | NR               |
| 430       | 26038            | NR               | 560       | 102904           | NR               | 690       | 20210            | NR               | 820       | 2742             | NR               | 950       | 2115             | NR               |
| 435       | 41316            | NR               | 565       | 112009           | NR               | 695       | 17459            | NR               | 825       | 2014             | NR               | 955       | 2634             | NR               |
| 440       | 59674            | NR               | 570       | 121662           | NR               | 700       | 15207            | NR               | 830       | 2488             | NR               | 960       | 4200             | NR               |
| 445       | 72751            | NR               | 575       | 130476           | NR               | 705       | 13322            | NR               | 835       | 2625             | NR               | 965       | 1982             | NR               |
| 450       | 65091            | NR               | 580       | 137926           | NR               | 710       | 11676            | NR               | 840       | 2754             | NR               | 970       | 3613             | NR               |
| 455       | 44894            | NR               | 585       | 143406           | NR               | 715       | 10626            | NR               | 845       | 2708             | NR               | 975       | 4034             | NR               |
| 460       | 32712            | NR               | 590       | 147039           | NR               | 720       | 9416             | NR               | 850       | 2608             | NR               | 980       | 3922             | NR               |
| 465       | 25296            | NR               | 595       | 147365           | NR               | 725       | 8333             | NR               | 855       | 2605             | NR               | 985       | 1909             | NR               |
| 470       | 19318            | NR               | 600       | 145800           | NR               | 730       | 7134             | NR               | 860       | 1765             | NR               | 990       | 3617             | NR               |
| 475       | 17265            | NR               | 605       | 141363           | NR               | 735       | 6437             | NR               | 865       | 2581             | NR               | 995       | 4767             | NR               |
| 480       | 18260            | NR               | 610       | 134199           | NR               | 740       | 5834             | NR               | 870       | 3016             | NR               | 1000      | 2528             | NR               |
| 485       | 20845            | NR               | 615       | 127683           | NR               | 745       | 5500             | NR               | 875       | 3952             | NR               |           |                  |                  |

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**Summary**

$R_f = 75.7$   
 $R_g = 93.9$   
 CIE  $R_a = 71.8$   
 $R_g = -38.3$



**Color Vector Graphics**



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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 67 | CES51 = 87 | CES76 = 63 |
| CES02 = 63 | CES27 = 88 | CES52 = 86 | CES77 = 80 |
| CES03 = 31 | CES28 = 87 | CES53 = 78 | CES78 = 67 |
| CES04 = 71 | CES29 = 66 | CES54 = 84 | CES79 = 87 |
| CES05 = 49 | CES30 = 73 | CES55 = 84 | CES80 = 86 |
| CES06 = 51 | CES31 = 70 | CES56 = 75 | CES81 = 71 |
| CES07 = 41 | CES32 = 65 | CES57 = 74 | CES82 = 94 |
| CES08 = 40 | CES33 = 73 | CES58 = 76 | CES83 = 90 |
| CES09 = 29 | CES34 = 79 | CES59 = 85 | CES84 = 89 |
| CES10 = 76 | CES35 = 89 | CES60 = 93 | CES85 = 77 |
| CES11 = 59 | CES36 = 97 | CES61 = 84 | CES86 = 61 |
| CES12 = 65 | CES37 = 87 | CES62 = 91 | CES87 = 78 |
| CES13 = 43 | CES38 = 81 | CES63 = 77 | CES88 = 77 |
| CES14 = 74 | CES39 = 95 | CES64 = 72 | CES89 = 67 |
| CES15 = 71 | CES40 = 92 | CES65 = 68 | CES90 = 76 |
| CES16 = 47 | CES41 = 88 | CES66 = 69 | CES91 = 89 |
| CES17 = 50 | CES42 = 89 | CES67 = 67 | CES92 = 58 |
| CES18 = 56 | CES43 = 79 | CES68 = 72 | CES93 = 74 |
| CES19 = 73 | CES44 = 99 | CES69 = 81 | CES94 = 49 |
| CES20 = 66 | CES45 = 85 | CES70 = 66 | CES95 = 68 |
| CES21 = 87 | CES46 = 80 | CES71 = 67 | CES96 = 76 |
| CES22 = 79 | CES47 = 82 | CES72 = 88 | CES97 = 82 |
| CES23 = 92 | CES48 = 69 | CES73 = 59 | CES98 = 75 |
| CES24 = 91 | CES49 = 80 | CES74 = 95 | CES99 = 62 |
| CES25 = 73 | CES50 = 87 | CES75 = 69 |            |



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**Color Rendition by Hue-Angle Bin**



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**Measure Comparisons**



(END OF REPORT)