

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: P320184

Luminaire Tested: **GLEON-SA0D-830-U-SL4**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P320184  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-24)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA0D-830-U-SL4  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(10) 80 CRI, 3000K, 1200mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE IV  
SPILL LIGHT ELIMINATOR OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 57991 lumens  
Efficiency: N/A  
Efficacy: 90.6 lumens/watt  
Luminous Opening: Rectangular (W 2.5' x L: 1' x H: 0')  
IES Classification: Type IV - Short  
BUG Rating: B3 - U0 - G5

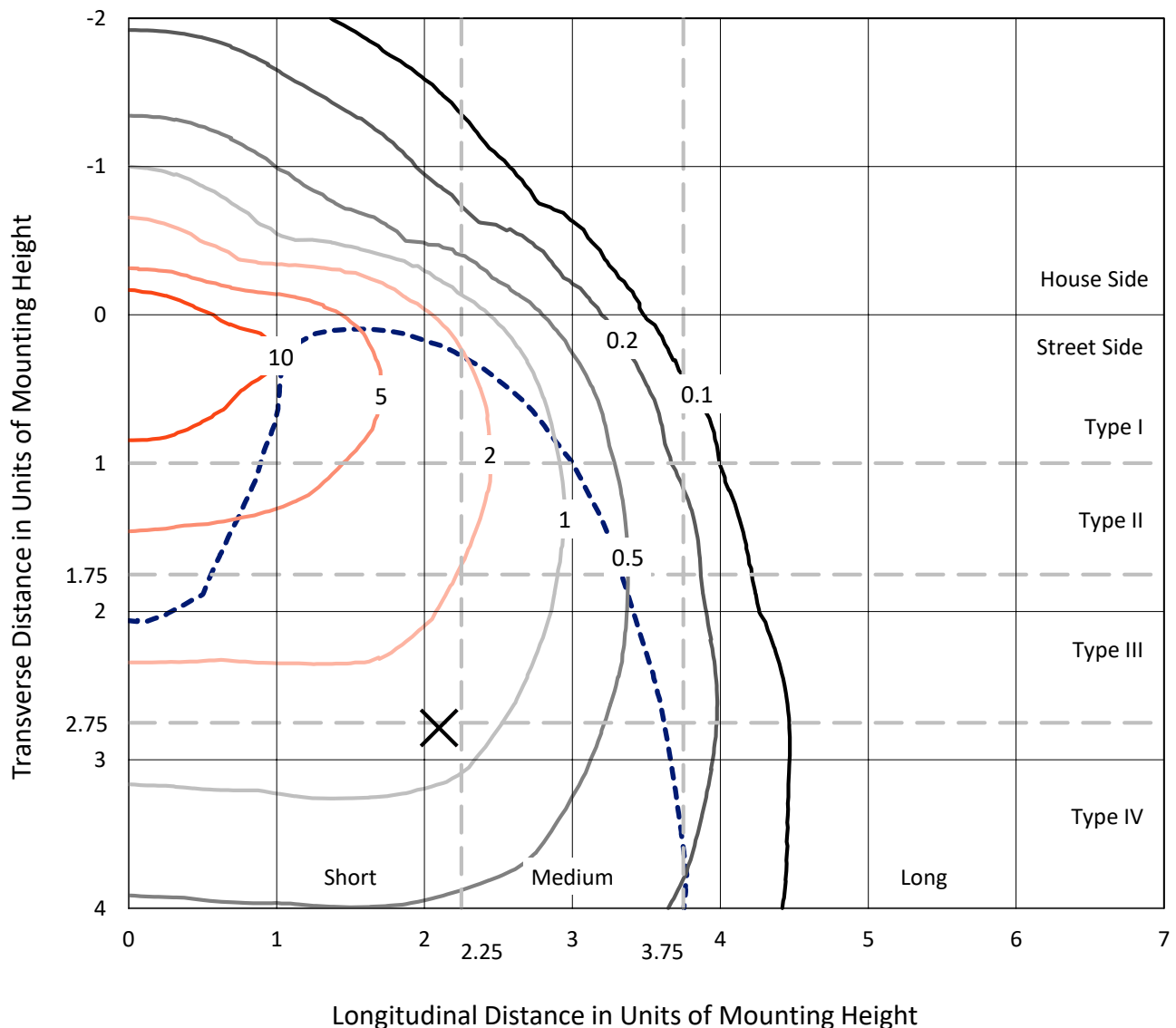
Input Watts (W): 640  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



REPORT NUMBER: P320184  
 CATALOG NUMBER: GLEON-SA0D-830-U-SL4

## Iso-Footcandle Lines of Horizontal Illumination

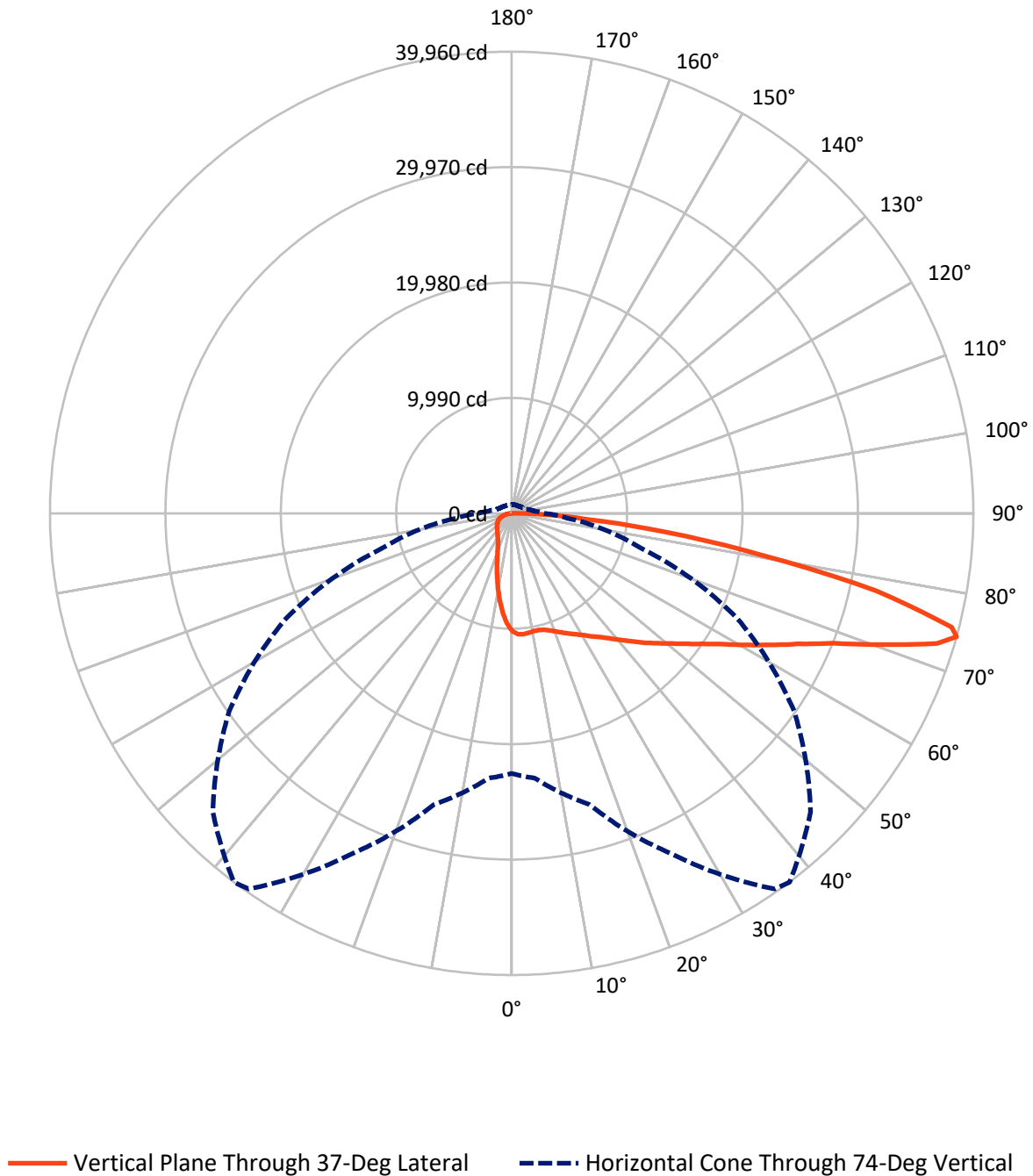
× Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 16.6 fc  
 Type IV - Short - N/A

REPORT NUMBER: P320184  
CATALOG NUMBER: GLEON-SA0D-830-U-SL4

## Luminous Intensity Polar Plot



REPORT NUMBER: P320184

CATALOG NUMBER: GLEON-SA0D-830-U-SL4

**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 7979.2   | 0.0    | 7979.2  |
|                    | % Fixture | 13.8     | 0.0    | 13.8    |
| <b>Street Side</b> | Lumens    | 50011.8  | 0.0    | 50011.8 |
|                    | % Fixture | 86.2     | 0.0    | 86.2    |
| <b>Total</b>       | Lumens    | 57991.0  | 0.0    | 57991.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 899.8   | 1.6       |
| 10°-20°   | 2306.4  | 4.0       |
| 20°-30°   | 3553.7  | 6.1       |
| 30°-40°   | 5167.6  | 8.9       |
| 40°-50°   | 7605.9  | 13.1      |
| 50°-60°   | 10681.1 | 18.4      |
| 60°-70°   | 13518.9 | 23.3      |
| 70°-80°   | 11903.9 | 20.5      |
| 80°-90°   | 2353.7  | 4.1       |
| 90°-100°  | 0.0     | 0.0       |
| 100°-110° | 0.0     | 0.0       |
| 110°-120° | 0.0     | 0.0       |
| 120°-130° | 0.0     | 0.0       |
| 130°-140° | 0.0     | 0.0       |
| 140°-150° | 0.0     | 0.0       |
| 150°-160° | 0.0     | 0.0       |
| 160°-170° | 0.0     | 0.0       |
| 170°-180° | 0.0     | 0.0       |
| 0°-90°    | 57991.0 | 100.0     |
| 0°-180°   | 57991.0 | 100.0     |

**Coefficient of Utilization**



REPORT NUMBER: P320184

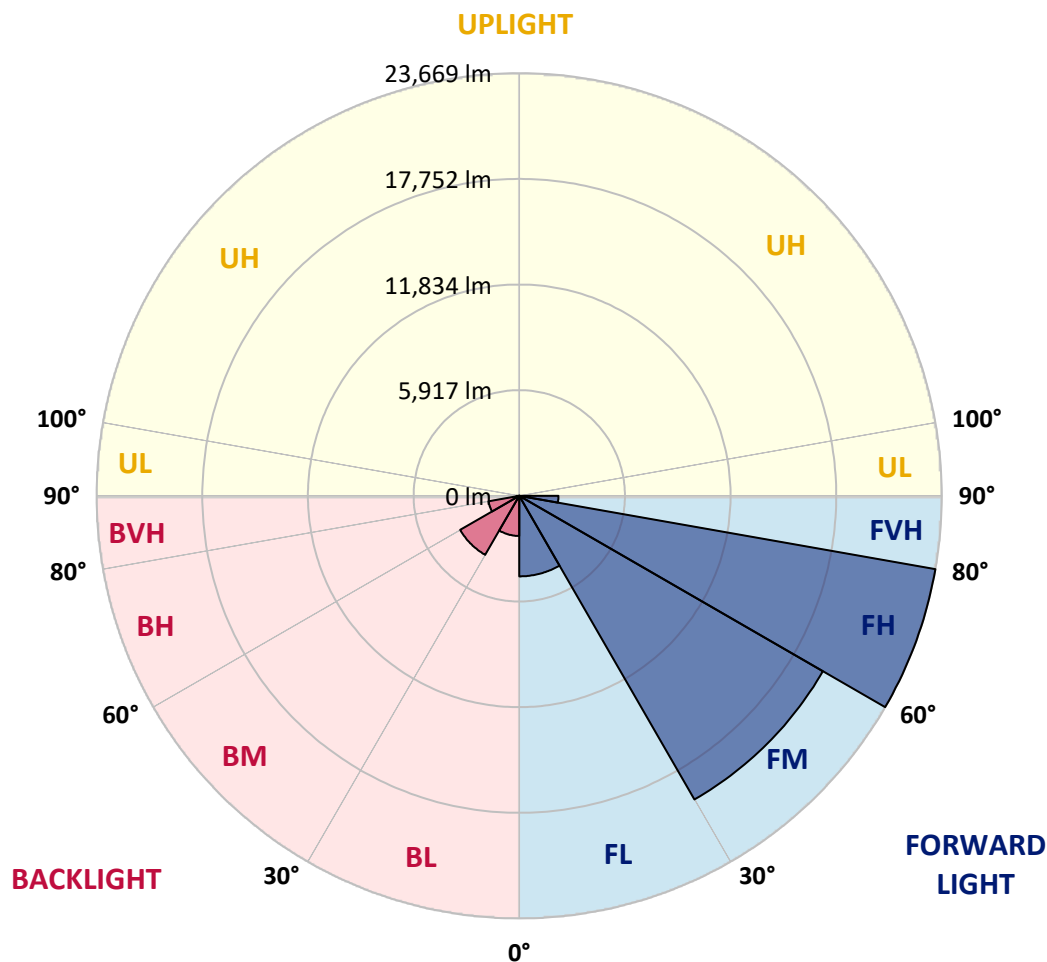
CATALOG NUMBER: GLEON-SA0D-830-U-SL4

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

| Zone |             | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|---------|-----------|-------------------------|------|---------|
|      |             |         |           | B                       | U    | G       |
| FL   | (0°-30°)    | 4512.4  | 7.8       |                         |      |         |
| FM   | (30°-60°)   | 19636.2 | 33.9      |                         |      |         |
| FH   | (60°-80°)   | 23669.0 | 40.8      |                         |      | G5      |
| FVH  | (80°-90°)   | 2194.3  | 3.8       |                         |      | G5      |
| BL   | (0°-30°)    | 2247.5  | 3.9       | B3/2500                 |      |         |
| BM   | (30°-60°)   | 3818.3  | 6.6       | B3/5000                 |      |         |
| BH   | (60°-80°)   | 1753.9  | 3.0       | B3/2500                 |      | G3/2500 |
| BVH  | (80°-90°)   | 159.4   | 0.3       |                         |      | G2/225  |
| 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





REPORT NUMBER: P320184

CATALOG NUMBER: GLEON-SA0D-830-U-SL4

**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 37°     | 45°     | 55°     | 65°     | 75°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 10217.8 | 10217.8 | 10217.8 | 10217.8 | 10217.8 | 10217.8 | 10217.8 | 10217.8 | 10217.8 | 10217.8 | 10217.8 |
| 2.5°  | 10567.1 | 10569.1 | 10567.1 | 10550.8 | 10511.9 | 10479.3 | 10452.7 | 10413.9 | 10328.1 | 10262.7 | 10164.7 |
| 5°    | 10667.2 | 10654.9 | 10646.8 | 10616.1 | 10554.8 | 10518.1 | 10467.0 | 10393.5 | 10252.5 | 10121.8 | 9962.4  |
| 7.5°  | 10620.2 | 10605.9 | 10587.5 | 10550.8 | 10481.3 | 10450.7 | 10379.2 | 10283.2 | 10113.6 | 9942.0  | 9713.2  |
| 10°   | 10475.2 | 10471.1 | 10462.9 | 10454.7 | 10395.5 | 10371.0 | 10305.6 | 10203.5 | 10036.0 | 9827.6  | 9560.0  |
| 12.5° | 10313.8 | 10324.0 | 10356.7 | 10399.6 | 10373.0 | 10360.8 | 10319.9 | 10250.5 | 10078.9 | 9854.2  | 9531.4  |
| 15°   | 10211.7 | 10240.3 | 10328.1 | 10440.4 | 10462.9 | 10458.8 | 10448.6 | 10403.7 | 10221.9 | 9972.7  | 9596.8  |
| 17.5° | 10176.9 | 10223.9 | 10391.4 | 10577.3 | 10642.7 | 10657.0 | 10661.1 | 10583.4 | 10381.2 | 10117.7 | 9664.2  |
| 20°   | 10240.3 | 10299.5 | 10544.6 | 10800.0 | 10904.2 | 10912.3 | 10893.9 | 10759.1 | 10532.4 | 10242.3 | 9701.0  |
| 22.5° | 10432.3 | 10485.4 | 10791.8 | 11079.8 | 11198.3 | 11210.6 | 11155.4 | 10951.1 | 10691.7 | 10389.4 | 9752.0  |
| 25°   | 10802.0 | 10867.4 | 11173.8 | 11461.8 | 11523.1 | 11525.1 | 11445.5 | 11192.2 | 10900.1 | 10595.7 | 9862.4  |
| 27.5° | 11284.1 | 11349.5 | 11625.2 | 11907.1 | 11874.5 | 11856.1 | 11747.8 | 11494.5 | 11171.7 | 10879.6 | 10058.5 |
| 30°   | 11821.3 | 11892.8 | 12154.3 | 12354.5 | 12276.9 | 12240.1 | 12152.3 | 11825.4 | 11549.7 | 11267.8 | 10358.7 |
| 32.5° | 12377.0 | 12442.3 | 12671.1 | 12808.0 | 12709.9 | 12693.6 | 12560.8 | 12262.6 | 12042.0 | 11860.2 | 10844.9 |
| 35°   | 12946.9 | 12993.9 | 13218.6 | 13296.2 | 13165.5 | 13161.4 | 13124.6 | 12850.9 | 12712.0 | 12797.8 | 11551.7 |
| 37.5° | 13529.1 | 13541.3 | 13733.3 | 13737.4 | 13698.6 | 13715.0 | 13753.8 | 13582.2 | 13621.0 | 13888.6 | 12470.9 |
| 40°   | 14047.9 | 14080.6 | 14219.5 | 14262.4 | 14329.8 | 14387.0 | 14581.1 | 14468.7 | 14769.0 | 15242.9 | 13614.9 |
| 42.5° | 14432.0 | 14495.3 | 14717.9 | 14828.3 | 15046.8 | 15136.7 | 15410.4 | 15514.6 | 16119.3 | 16830.1 | 14975.3 |
| 45°   | 14756.8 | 14854.8 | 15212.3 | 15439.0 | 15808.8 | 15966.1 | 16358.3 | 16707.6 | 17645.2 | 18552.2 | 16407.3 |
| 47.5° | 15108.1 | 15232.7 | 15680.1 | 16113.1 | 16615.7 | 16793.4 | 17506.3 | 18029.2 | 19273.3 | 20284.4 | 17757.5 |
| 50°   | 15624.9 | 15720.9 | 16158.1 | 16838.3 | 17465.4 | 17694.2 | 18680.9 | 19430.6 | 20927.9 | 21935.0 | 18928.0 |
| 52.5° | 16346.0 | 16309.2 | 16679.0 | 17632.9 | 18474.5 | 18756.4 | 19935.1 | 20921.8 | 22605.0 | 23428.2 | 19916.7 |
| 55°   | 17071.2 | 17009.9 | 17269.3 | 18464.3 | 19651.2 | 19947.4 | 21316.0 | 22419.1 | 24200.4 | 24772.3 | 20674.6 |
| 57.5° | 17878.1 | 17761.6 | 17980.2 | 19402.0 | 20991.2 | 21344.6 | 22862.4 | 24010.4 | 25769.2 | 25859.1 | 21156.7 |
| 60°   | 18709.5 | 18552.2 | 18797.3 | 20564.3 | 22692.8 | 23109.5 | 24672.2 | 25562.9 | 27248.1 | 26729.3 | 21311.9 |
| 62.5° | 19436.7 | 19326.4 | 19704.3 | 21861.4 | 24610.9 | 25068.5 | 26449.4 | 27213.4 | 28706.6 | 27090.8 | 20752.2 |
| 65°   | 20072.0 | 20090.4 | 20744.0 | 23319.9 | 26749.7 | 27237.9 | 28488.1 | 29248.0 | 29854.7 | 26876.3 | 19442.8 |
| 67.5° | 20829.8 | 20934.0 | 22049.3 | 25240.1 | 29442.0 | 29977.2 | 31454.1 | 31466.4 | 30496.1 | 25618.0 | 16864.9 |
| 70°   | 21935.0 | 22149.4 | 23844.9 | 27903.8 | 33270.1 | 34005.5 | 35145.4 | 32769.6 | 29595.2 | 22206.6 | 13269.6 |
| 72.5° | 22915.5 | 23315.8 | 25754.9 | 30951.6 | 37935.7 | 38493.4 | 37304.5 | 32017.9 | 25830.5 | 16642.2 | 8267.0  |
| 74°   | 22517.1 | 23013.5 | 26102.1 | 32453.0 | 39692.5 | 39960.1 | 36575.3 | 29824.0 | 21536.6 | 11525.1 | 4804.5  |
| 75°   | 21659.2 | 22198.5 | 25595.5 | 32438.7 | 39469.8 | 39320.7 | 34814.4 | 27317.6 | 17737.1 | 7860.5  | 3196.9  |
| 77.5° | 17479.7 | 18049.7 | 21567.3 | 27801.7 | 32363.1 | 32222.2 | 26743.6 | 18325.4 | 7768.5  | 2577.9  | 1624.0  |
| 80°   | 10162.6 | 10597.7 | 13388.1 | 17655.4 | 21822.6 | 22077.9 | 17588.0 | 9067.7  | 3055.9  | 1448.3  | 1101.0  |
| 82.5° | 4514.5  | 4814.7  | 6467.3  | 9012.6  | 13169.5 | 13498.4 | 9210.7  | 4751.4  | 1887.5  | 880.4   | 661.8   |
| 85°   | 2962.0  | 3184.6  | 3926.1  | 4291.8  | 6271.2  | 6495.9  | 4508.3  | 3699.4  | 1246.1  | 484.1   | 486.2   |
| 87.5° | 2130.6  | 2345.1  | 2917.0  | 2547.3  | 2878.2  | 2725.0  | 2453.3  | 3423.6  | 500.5   | 275.8   | 163.4   |
| 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: P320184

CATALOG NUMBER: GLEON-SA0D-830-U-SL4

**CANDELA DISTRIBUTION (continued):**

|       | 90°     | 95°     | 105°    | 115°    | 125°    | 135°    | 145°    | 155°    | 165°    | 175°    | 180°    |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 10217.8 | 10217.8 | 10217.8 | 10217.8 | 10217.8 | 10217.8 | 10217.8 | 10217.8 | 10217.8 | 10217.8 | 10217.8 |
| 2.5°  | 10121.8 | 10089.1 | 10015.6 | 9876.7  | 9799.0  | 9733.7  | 9625.4  | 9562.1  | 9533.5  | 9531.4  | 9543.7  |
| 5°    | 9870.5  | 9794.9  | 9605.0  | 9372.1  | 9186.2  | 9016.7  | 8806.3  | 8679.6  | 8589.7  | 8536.6  | 8550.9  |
| 7.5°  | 9578.4  | 9459.9  | 9161.7  | 8789.9  | 8491.7  | 8162.8  | 7838.0  | 7643.9  | 7492.8  | 7380.4  | 7400.8  |
| 10°   | 9378.2  | 9214.8  | 8779.7  | 8244.5  | 7748.1  | 7270.1  | 6822.8  | 6555.2  | 6342.7  | 6179.3  | 6191.5  |
| 12.5° | 9310.8  | 9090.2  | 8487.6  | 7772.6  | 7076.1  | 6422.4  | 5838.2  | 5427.6  | 5209.0  | 5023.1  | 5037.4  |
| 15°   | 9321.0  | 9024.8  | 8242.5  | 7347.7  | 6471.4  | 5648.2  | 4939.3  | 4459.3  | 4163.1  | 4034.4  | 4036.5  |
| 17.5° | 9329.2  | 8949.2  | 7985.1  | 6892.2  | 5872.9  | 4925.0  | 4154.9  | 3668.8  | 3388.9  | 3270.4  | 3272.5  |
| 20°   | 9302.6  | 8826.7  | 7666.4  | 6369.3  | 5247.8  | 4261.2  | 3515.6  | 3102.9  | 2890.5  | 2798.6  | 2798.6  |
| 22.5° | 9267.9  | 8681.6  | 7306.9  | 5844.3  | 4630.9  | 3685.1  | 3058.0  | 2743.4  | 2620.8  | 2559.6  | 2557.5  |
| 25°   | 9284.3  | 8573.4  | 6939.2  | 5305.0  | 4063.0  | 3225.5  | 2753.6  | 2545.3  | 2463.5  | 2424.7  | 2422.7  |
| 27.5° | 9372.1  | 8522.3  | 6600.1  | 4767.8  | 3566.6  | 2880.3  | 2549.3  | 2402.3  | 2349.2  | 2324.6  | 2324.6  |
| 30°   | 9531.4  | 8522.3  | 6246.7  | 4310.2  | 3154.0  | 2624.9  | 2392.0  | 2292.0  | 2255.2  | 2238.8  | 2238.8  |
| 32.5° | 9809.2  | 8569.3  | 5905.6  | 3856.7  | 2825.1  | 2424.7  | 2261.3  | 2193.9  | 2165.3  | 2157.1  | 2157.1  |
| 35°   | 10287.2 | 8728.6  | 5572.6  | 3427.7  | 2559.6  | 2261.3  | 2136.7  | 2097.9  | 2077.5  | 2075.4  | 2081.6  |
| 37.5° | 10959.3 | 9053.4  | 5260.1  | 3111.1  | 2371.6  | 2128.5  | 2032.5  | 2001.9  | 1989.6  | 1999.8  | 2008.0  |
| 40°   | 11805.0 | 9494.7  | 4976.1  | 2825.1  | 2228.6  | 2022.3  | 1936.5  | 1916.1  | 1910.0  | 1924.3  | 1936.5  |
| 42.5° | 12826.4 | 10091.1 | 4743.2  | 2618.8  | 2118.3  | 1932.4  | 1854.8  | 1830.3  | 1824.2  | 1840.5  | 1856.9  |
| 45°   | 13931.5 | 10732.6 | 4579.8  | 2465.6  | 2032.5  | 1865.0  | 1783.3  | 1756.8  | 1744.5  | 1752.7  | 1771.1  |
| 47.5° | 14936.5 | 11339.3 | 4514.5  | 2357.3  | 1950.8  | 1807.8  | 1720.0  | 1687.3  | 1666.9  | 1662.8  | 1677.1  |
| 50°   | 15784.3 | 11790.7 | 4545.1  | 2292.0  | 1885.4  | 1744.5  | 1658.7  | 1621.9  | 1591.3  | 1572.9  | 1583.1  |
| 52.5° | 16401.2 | 12074.6 | 4573.7  | 2263.4  | 1834.4  | 1675.0  | 1591.3  | 1556.6  | 1515.7  | 1485.1  | 1485.1  |
| 55°   | 16848.5 | 12140.0 | 4510.4  | 2240.9  | 1795.6  | 1599.5  | 1515.7  | 1483.0  | 1442.2  | 1407.4  | 1403.4  |
| 57.5° | 17024.2 | 11956.2 | 4275.5  | 2208.2  | 1769.0  | 1528.0  | 1436.0  | 1411.5  | 1376.8  | 1336.0  | 1333.9  |
| 60°   | 16787.2 | 11388.3 | 3822.0  | 2138.7  | 1734.3  | 1468.7  | 1356.4  | 1340.0  | 1323.7  | 1284.9  | 1282.8  |
| 62.5° | 15835.3 | 10142.2 | 3235.7  | 1997.8  | 1664.8  | 1405.4  | 1282.8  | 1291.0  | 1293.1  | 1266.5  | 1262.4  |
| 65°   | 14109.2 | 8430.4  | 2663.7  | 1814.0  | 1560.7  | 1329.8  | 1207.3  | 1246.1  | 1268.5  | 1264.5  | 1258.3  |
| 67.5° | 11600.7 | 6561.3  | 2257.2  | 1619.9  | 1423.8  | 1225.6  | 1125.6  | 1170.5  | 1188.9  | 1203.2  | 1199.1  |
| 70°   | 8610.2  | 4626.8  | 1867.1  | 1415.6  | 1258.3  | 1103.1  | 1019.3  | 1041.8  | 1029.5  | 1045.9  | 1052.0  |
| 72.5° | 4800.4  | 2776.1  | 1521.8  | 1211.3  | 1086.7  | 960.1   | 900.8   | 896.8   | 870.2   | 870.2   | 870.2   |
| 74°   | 2880.3  | 2036.6  | 1338.0  | 1084.7  | 982.6   | 866.1   | 815.1   | 796.7   | 772.2   | 774.2   | 772.2   |
| 75°   | 2316.5  | 1750.6  | 1227.7  | 1000.9  | 909.0   | 811.0   | 759.9   | 735.4   | 717.0   | 717.0   | 715.0   |
| 77.5° | 1462.6  | 1329.8  | 988.7   | 796.7   | 727.2   | 668.0   | 633.2   | 600.6   | 600.6   | 598.5   | 596.5   |
| 80°   | 1105.1  | 1058.1  | 770.1   | 602.6   | 557.7   | 512.7   | 490.3   | 476.0   | 476.0   | 482.1   | 480.0   |
| 82.5° | 757.9   | 796.7   | 541.3   | 420.8   | 398.3   | 365.7   | 361.6   | 363.6   | 357.5   | 349.3   | 347.3   |
| 85°   | 553.6   | 598.5   | 365.7   | 265.6   | 243.1   | 222.7   | 239.0   | 247.2   | 237.0   | 218.6   | 210.4   |
| 87.5° | 212.4   | 392.2   | 196.1   | 110.3   | 102.1   | 87.8    | 102.1   | 106.2   | 114.4   | 89.9    | 91.9    |
| 90°   | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |

LM-79-2019: Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Report Prepared for

Cooper Lighting Solutions

MCGRAW EDISON

Report Number: SP1-2408-195-9

Test Date: 08/07/2024

Luminaire Tested: GALN-SB1A-830-U-5WQ

Data in this report applies to families of products including GALN-SB1A-830-U-5WQ.

### Test Information

Test Method: LM-79-2019  
 Report Number: SP1-2408-195-9  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry:  $4\pi$   
 Issue Date: 08/07/2024  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: MCGRAW EDISON  
 Catalog Number: **GALN-SB1A-830-U-5WQ**  
 Description: GALLEON AREA AND ROADWAY LUMINAIRE. (1) 80 CRI, 3000K, 350MA HIGH DENSITY LIGHTSQUARE WITH 26 LEDS AND TYPE V WIDE OPTICS

### Spectral Parameters

CCT (K): 3050  
 CIE  $u'$ : 0.2476  
 CIE  $v'$ : 0.5251  
 Duv: 0.0034  
 CIE x: 0.4383  
 CIE y: 0.4131  
 CIE z: 0.1487  
 Peak Wavelength (nm): 603  
 Dominant Wavelength (nm): 581  
 Purity: 55.55201  
 R<sub>f</sub>: 81.5  
 R<sub>g</sub>: 99.2

CRI (Ra): 81.0  
 R1: 79.6  
 R2: 85.6  
 R3: 92.0  
 R4: 82.6  
 R5: 78.9  
 R6: 81.7  
 R7: 85.2  
 R8: 62.0  
 R9: 7.1  
 R10: 67.0  
 R11: 82.7  
 R12: 63.2  
 R13: 80.3  
 R14: 95.0  
 R15: 71.7



### Test Conditions

Stabilization Time: 20M  
 Operation Time: 1H 20M  
 Sphere Temperature (°C): 24.2

REPORT NUMBER: SP1-2408-195-9

| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | IN0058                | 6/18/2024        | 12/18/2024           |
| Power Meter                    | INXT2011004           | 2/8/2024         | 2/8/2025             |
| AC Power Source                | IN0063                | 10/24/2023       | 10/24/2024           |
| DC Power Source                | IN0208                | 10/24/2023       | 10/24/2024           |
| Sphere Thermometer             | IN0085                | 10/24/2023       | 10/24/2024           |
| Room Thermometer               | IN0046                | 10/24/2023       | 10/24/2024           |

REPORT NUMBER: SP1-2408-195-9

**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

REPORT NUMBER: SP1-2408-195-9

### Photopic Flux vs. Wavelength



### Photopic Lumens: NR

| λ (nm) | Power W <sup>λ</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>λ</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>λ</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>λ</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>λ</sup> /nm | Lumens (φ/nm) |
|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|
| 360    | 0                        | NR            | 490    | 168                      | NR            | 620    | 940                      | NR            | 750    | 35                       | NR            | 880    | 1                        | NR            |
| 365    | 0                        | NR            | 495    | 233                      | NR            | 625    | 897                      | NR            | 755    | 30                       | NR            | 885    | 1                        | NR            |
| 370    | 0                        | NR            | 500    | 300                      | NR            | 630    | 847                      | NR            | 760    | 26                       | NR            | 890    | 1                        | NR            |
| 375    | 0                        | NR            | 505    | 372                      | NR            | 635    | 790                      | NR            | 765    | 22                       | NR            | 895    | 1                        | NR            |
| 380    | 0                        | NR            | 510    | 430                      | NR            | 640    | 730                      | NR            | 770    | 19                       | NR            | 900    | 1                        | NR            |
| 385    | 0                        | NR            | 515    | 483                      | NR            | 645    | 668                      | NR            | 775    | 16                       | NR            | 905    | 1                        | NR            |
| 390    | 0                        | NR            | 520    | 524                      | NR            | 650    | 605                      | NR            | 780    | 14                       | NR            | 910    | 0                        | NR            |
| 395    | 2                        | NR            | 525    | 555                      | NR            | 655    | 545                      | NR            | 785    | 12                       | NR            | 915    | 0                        | NR            |
| 400    | 4                        | NR            | 530    | 581                      | NR            | 660    | 485                      | NR            | 790    | 10                       | NR            | 920    | 0                        | NR            |
| 405    | 7                        | NR            | 535    | 604                      | NR            | 665    | 430                      | NR            | 795    | 9                        | NR            | 925    | 0                        | NR            |
| 410    | 17                       | NR            | 540    | 623                      | NR            | 670    | 378                      | NR            | 800    | 8                        | NR            | 930    | 0                        | NR            |
| 415    | 34                       | NR            | 545    | 645                      | NR            | 675    | 331                      | NR            | 805    | 7                        | NR            | 935    | 0                        | NR            |
| 420    | 68                       | NR            | 550    | 667                      | NR            | 680    | 290                      | NR            | 810    | 6                        | NR            | 940    | 0                        | NR            |
| 425    | 128                      | NR            | 555    | 693                      | NR            | 685    | 251                      | NR            | 815    | 5                        | NR            | 945    | 0                        | NR            |
| 430    | 214                      | NR            | 560    | 719                      | NR            | 690    | 218                      | NR            | 820    | 4                        | NR            | 950    | 0                        | NR            |
| 435    | 339                      | NR            | 565    | 754                      | NR            | 695    | 188                      | NR            | 825    | 4                        | NR            | 955    | 0                        | NR            |
| 440    | 507                      | NR            | 570    | 791                      | NR            | 700    | 162                      | NR            | 830    | 3                        | NR            | 960    | 0                        | NR            |
| 445    | 573                      | NR            | 575    | 830                      | NR            | 705    | 139                      | NR            | 835    | 3                        | NR            | 965    | 0                        | NR            |
| 450    | 356                      | NR            | 580    | 873                      | NR            | 710    | 119                      | NR            | 840    | 3                        | NR            | 970    | 0                        | NR            |
| 455    | 217                      | NR            | 585    | 913                      | NR            | 715    | 102                      | NR            | 845    | 2                        | NR            | 975    | 0                        | NR            |
| 460    | 168                      | NR            | 590    | 948                      | NR            | 720    | 88                       | NR            | 850    | 2                        | NR            | 980    | 0                        | NR            |
| 465    | 113                      | NR            | 595    | 974                      | NR            | 725    | 76                       | NR            | 855    | 2                        | NR            | 985    | 0                        | NR            |
| 470    | 85                       | NR            | 600    | 994                      | NR            | 730    | 65                       | NR            | 860    | 1                        | NR            | 990    | 0                        | NR            |
| 475    | 85                       | NR            | 605    | 998                      | NR            | 735    | 55                       | NR            | 865    | 1                        | NR            | 995    | 0                        | NR            |
| 480    | 94                       | NR            | 610    | 994                      | NR            | 740    | 47                       | NR            | 870    | 1                        | NR            | 1000   | 0                        | NR            |
| 485    | 120                      | NR            | 615    | 973                      | NR            | 745    | 41                       | NR            | 875    | 1                        | NR            |        |                          |               |

REPORT NUMBER: SP1-2408-195-9

### Scotopic Flux vs. Wavelength



Scotopic Lumens: NR

S/P: 1.27

| λ (nm) | Power W <sup>Λ</sup> /nm | Lumens (Φ/nm) | λ (nm) | Power W <sup>Λ</sup> /nm | Lumens (Φ/nm) | λ (nm) | Power W <sup>Λ</sup> /nm | Lumens (Φ/nm) | λ (nm) | Power W <sup>Λ</sup> /nm | Lumens (Φ/nm) | λ (nm) | Power W <sup>Λ</sup> /nm | Lumens (Φ/nm) |
|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|
| 360    | 0                        | NR            | 490    | 168                      | NR            | 620    | 940                      | NR            | 750    | 35                       | NR            | 880    | 1                        | NR            |
| 365    | 0                        | NR            | 495    | 233                      | NR            | 625    | 897                      | NR            | 755    | 30                       | NR            | 885    | 1                        | NR            |
| 370    | 0                        | NR            | 500    | 300                      | NR            | 630    | 847                      | NR            | 760    | 26                       | NR            | 890    | 1                        | NR            |
| 375    | 0                        | NR            | 505    | 372                      | NR            | 635    | 790                      | NR            | 765    | 22                       | NR            | 895    | 1                        | NR            |
| 380    | 0                        | NR            | 510    | 430                      | NR            | 640    | 730                      | NR            | 770    | 19                       | NR            | 900    | 1                        | NR            |
| 385    | 0                        | NR            | 515    | 483                      | NR            | 645    | 668                      | NR            | 775    | 16                       | NR            | 905    | 1                        | NR            |
| 390    | 0                        | NR            | 520    | 524                      | NR            | 650    | 605                      | NR            | 780    | 14                       | NR            | 910    | 0                        | NR            |
| 395    | 2                        | NR            | 525    | 555                      | NR            | 655    | 545                      | NR            | 785    | 12                       | NR            | 915    | 0                        | NR            |
| 400    | 4                        | NR            | 530    | 581                      | NR            | 660    | 485                      | NR            | 790    | 10                       | NR            | 920    | 0                        | NR            |
| 405    | 7                        | NR            | 535    | 604                      | NR            | 665    | 430                      | NR            | 795    | 9                        | NR            | 925    | 0                        | NR            |
| 410    | 17                       | NR            | 540    | 623                      | NR            | 670    | 378                      | NR            | 800    | 8                        | NR            | 930    | 0                        | NR            |
| 415    | 34                       | NR            | 545    | 645                      | NR            | 675    | 331                      | NR            | 805    | 7                        | NR            | 935    | 0                        | NR            |
| 420    | 68                       | NR            | 550    | 667                      | NR            | 680    | 290                      | NR            | 810    | 6                        | NR            | 940    | 0                        | NR            |
| 425    | 128                      | NR            | 555    | 693                      | NR            | 685    | 251                      | NR            | 815    | 5                        | NR            | 945    | 0                        | NR            |
| 430    | 214                      | NR            | 560    | 719                      | NR            | 690    | 218                      | NR            | 820    | 4                        | NR            | 950    | 0                        | NR            |
| 435    | 339                      | NR            | 565    | 754                      | NR            | 695    | 188                      | NR            | 825    | 4                        | NR            | 955    | 0                        | NR            |
| 440    | 507                      | NR            | 570    | 791                      | NR            | 700    | 162                      | NR            | 830    | 3                        | NR            | 960    | 0                        | NR            |
| 445    | 573                      | NR            | 575    | 830                      | NR            | 705    | 139                      | NR            | 835    | 3                        | NR            | 965    | 0                        | NR            |
| 450    | 356                      | NR            | 580    | 873                      | NR            | 710    | 119                      | NR            | 840    | 3                        | NR            | 970    | 0                        | NR            |
| 455    | 217                      | NR            | 585    | 913                      | NR            | 715    | 102                      | NR            | 845    | 2                        | NR            | 975    | 0                        | NR            |
| 460    | 168                      | NR            | 590    | 948                      | NR            | 720    | 88                       | NR            | 850    | 2                        | NR            | 980    | 0                        | NR            |
| 465    | 113                      | NR            | 595    | 974                      | NR            | 725    | 76                       | NR            | 855    | 2                        | NR            | 985    | 0                        | NR            |
| 470    | 85                       | NR            | 600    | 994                      | NR            | 730    | 65                       | NR            | 860    | 1                        | NR            | 990    | 0                        | NR            |
| 475    | 85                       | NR            | 605    | 998                      | NR            | 735    | 55                       | NR            | 865    | 1                        | NR            | 995    | 0                        | NR            |
| 480    | 94                       | NR            | 610    | 994                      | NR            | 740    | 47                       | NR            | 870    | 1                        | NR            | 1000   | 0                        | NR            |
| 485    | 120                      | NR            | 615    | 973                      | NR            | 745    | 41                       | NR            | 875    | 1                        | NR            |        |                          |               |

REPORT NUMBER: SP1-2408-195-9

### Melanopic Flux vs. Wavelength


**Melanopic Lumens: NR**
**M/P: 2.32**

| $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) |
|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|
| 360               | 0                                    | NR                             | 490               | 168                                  | NR                             | 620               | 940                                  | NR                             | 750               | 35                                   | NR                             | 880               | 1                                    | NR                             |
| 365               | 0                                    | NR                             | 495               | 233                                  | NR                             | 625               | 897                                  | NR                             | 755               | 30                                   | NR                             | 885               | 1                                    | NR                             |
| 370               | 0                                    | NR                             | 500               | 300                                  | NR                             | 630               | 847                                  | NR                             | 760               | 26                                   | NR                             | 890               | 1                                    | NR                             |
| 375               | 0                                    | NR                             | 505               | 372                                  | NR                             | 635               | 790                                  | NR                             | 765               | 22                                   | NR                             | 895               | 1                                    | NR                             |
| 380               | 0                                    | NR                             | 510               | 430                                  | NR                             | 640               | 730                                  | NR                             | 770               | 19                                   | NR                             | 900               | 1                                    | NR                             |
| 385               | 0                                    | NR                             | 515               | 483                                  | NR                             | 645               | 668                                  | NR                             | 775               | 16                                   | NR                             | 905               | 1                                    | NR                             |
| 390               | 0                                    | NR                             | 520               | 524                                  | NR                             | 650               | 605                                  | NR                             | 780               | 14                                   | NR                             | 910               | 0                                    | NR                             |
| 395               | 2                                    | NR                             | 525               | 555                                  | NR                             | 655               | 545                                  | NR                             | 785               | 12                                   | NR                             | 915               | 0                                    | NR                             |
| 400               | 4                                    | NR                             | 530               | 581                                  | NR                             | 660               | 485                                  | NR                             | 790               | 10                                   | NR                             | 920               | 0                                    | NR                             |
| 405               | 7                                    | NR                             | 535               | 604                                  | NR                             | 665               | 430                                  | NR                             | 795               | 9                                    | NR                             | 925               | 0                                    | NR                             |
| 410               | 17                                   | NR                             | 540               | 623                                  | NR                             | 670               | 378                                  | NR                             | 800               | 8                                    | NR                             | 930               | 0                                    | NR                             |
| 415               | 34                                   | NR                             | 545               | 645                                  | NR                             | 675               | 331                                  | NR                             | 805               | 7                                    | NR                             | 935               | 0                                    | NR                             |
| 420               | 68                                   | NR                             | 550               | 667                                  | NR                             | 680               | 290                                  | NR                             | 810               | 6                                    | NR                             | 940               | 0                                    | NR                             |
| 425               | 128                                  | NR                             | 555               | 693                                  | NR                             | 685               | 251                                  | NR                             | 815               | 5                                    | NR                             | 945               | 0                                    | NR                             |
| 430               | 214                                  | NR                             | 560               | 719                                  | NR                             | 690               | 218                                  | NR                             | 820               | 4                                    | NR                             | 950               | 0                                    | NR                             |
| 435               | 339                                  | NR                             | 565               | 754                                  | NR                             | 695               | 188                                  | NR                             | 825               | 4                                    | NR                             | 955               | 0                                    | NR                             |
| 440               | 507                                  | NR                             | 570               | 791                                  | NR                             | 700               | 162                                  | NR                             | 830               | 3                                    | NR                             | 960               | 0                                    | NR                             |
| 445               | 573                                  | NR                             | 575               | 830                                  | NR                             | 705               | 139                                  | NR                             | 835               | 3                                    | NR                             | 965               | 0                                    | NR                             |
| 450               | 356                                  | NR                             | 580               | 873                                  | NR                             | 710               | 119                                  | NR                             | 840               | 3                                    | NR                             | 970               | 0                                    | NR                             |
| 455               | 217                                  | NR                             | 585               | 913                                  | NR                             | 715               | 102                                  | NR                             | 845               | 2                                    | NR                             | 975               | 0                                    | NR                             |
| 460               | 168                                  | NR                             | 590               | 948                                  | NR                             | 720               | 88                                   | NR                             | 850               | 2                                    | NR                             | 980               | 0                                    | NR                             |
| 465               | 113                                  | NR                             | 595               | 974                                  | NR                             | 725               | 76                                   | NR                             | 855               | 2                                    | NR                             | 985               | 0                                    | NR                             |
| 470               | 85                                   | NR                             | 600               | 994                                  | NR                             | 730               | 65                                   | NR                             | 860               | 1                                    | NR                             | 990               | 0                                    | NR                             |
| 475               | 85                                   | NR                             | 605               | 998                                  | NR                             | 735               | 55                                   | NR                             | 865               | 1                                    | NR                             | 995               | 0                                    | NR                             |
| 480               | 94                                   | NR                             | 610               | 994                                  | NR                             | 740               | 47                                   | NR                             | 870               | 1                                    | NR                             | 1000              | 0                                    | NR                             |
| 485               | 120                                  | NR                             | 615               | 973                                  | NR                             | 745               | 41                                   | NR                             | 875               | 1                                    | NR                             |                   |                                      |                                |

REPORT NUMBER: SP1-2408-195-9

TM-30-18

### Summary

$R_f = 81.5$   
 $R_g = 99.2$   
 $CIE\ R_a = 81.0$   
 $R_9 = 7.1$



### Color Vector Graphics



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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 74 | CES51 = 89 | CES76 = 70 |
| CES02 = 63 | CES27 = 88 | CES52 = 92 | CES77 = 86 |
| CES03 = 31 | CES28 = 89 | CES53 = 81 | CES78 = 72 |
| CES04 = 70 | CES29 = 67 | CES54 = 87 | CES79 = 90 |
| CES05 = 50 | CES30 = 68 | CES55 = 85 | CES80 = 88 |
| CES06 = 51 | CES31 = 71 | CES56 = 78 | CES81 = 78 |
| CES07 = 42 | CES32 = 70 | CES57 = 76 | CES82 = 95 |
| CES08 = 41 | CES33 = 71 | CES58 = 78 | CES83 = 90 |
| CES09 = 29 | CES34 = 82 | CES59 = 92 | CES84 = 94 |
| CES10 = 76 | CES35 = 90 | CES60 = 95 | CES85 = 86 |
| CES11 = 59 | CES36 = 93 | CES61 = 93 | CES86 = 72 |
| CES12 = 65 | CES37 = 87 | CES62 = 83 | CES87 = 85 |
| CES13 = 43 | CES38 = 75 | CES63 = 77 | CES88 = 83 |
| CES14 = 74 | CES39 = 94 | CES64 = 83 | CES89 = 75 |
| CES15 = 71 | CES40 = 89 | CES65 = 77 | CES90 = 81 |
| CES16 = 47 | CES41 = 85 | CES66 = 80 | CES91 = 96 |
| CES17 = 50 | CES42 = 86 | CES67 = 79 | CES92 = 73 |
| CES18 = 56 | CES43 = 81 | CES68 = 84 | CES93 = 84 |
| CES19 = 72 | CES44 = 99 | CES69 = 91 | CES94 = 64 |
| CES20 = 66 | CES45 = 87 | CES70 = 78 | CES95 = 80 |
| CES21 = 87 | CES46 = 82 | CES71 = 76 | CES96 = 84 |
| CES22 = 79 | CES47 = 77 | CES72 = 92 | CES97 = 87 |
| CES23 = 92 | CES48 = 71 | CES73 = 71 | CES98 = 81 |
| CES24 = 91 | CES49 = 81 | CES74 = 93 | CES99 = 74 |
| CES25 = 72 | CES50 = 89 | CES75 = 74 |            |



Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)