

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: P321755

Luminaire Tested: **GLEON-SA1B-830-U-T3R-HSS**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P321755  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-11)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA1B-830-U-T3R-HSS  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(1) 80 CRI, 3000K, 800mA LIGHTSQUARE WITH 16 LEDS AND TYPE III ROADWAY  
OPTICS WITH HOUSE SIDE SHIELD  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 3656 lumens  
Efficiency: N/A  
Efficacy: 83.1 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 0.5' x H: 0')  
IES Classification: Type III - Medium  
BUG Rating: B1 - U0 - G1

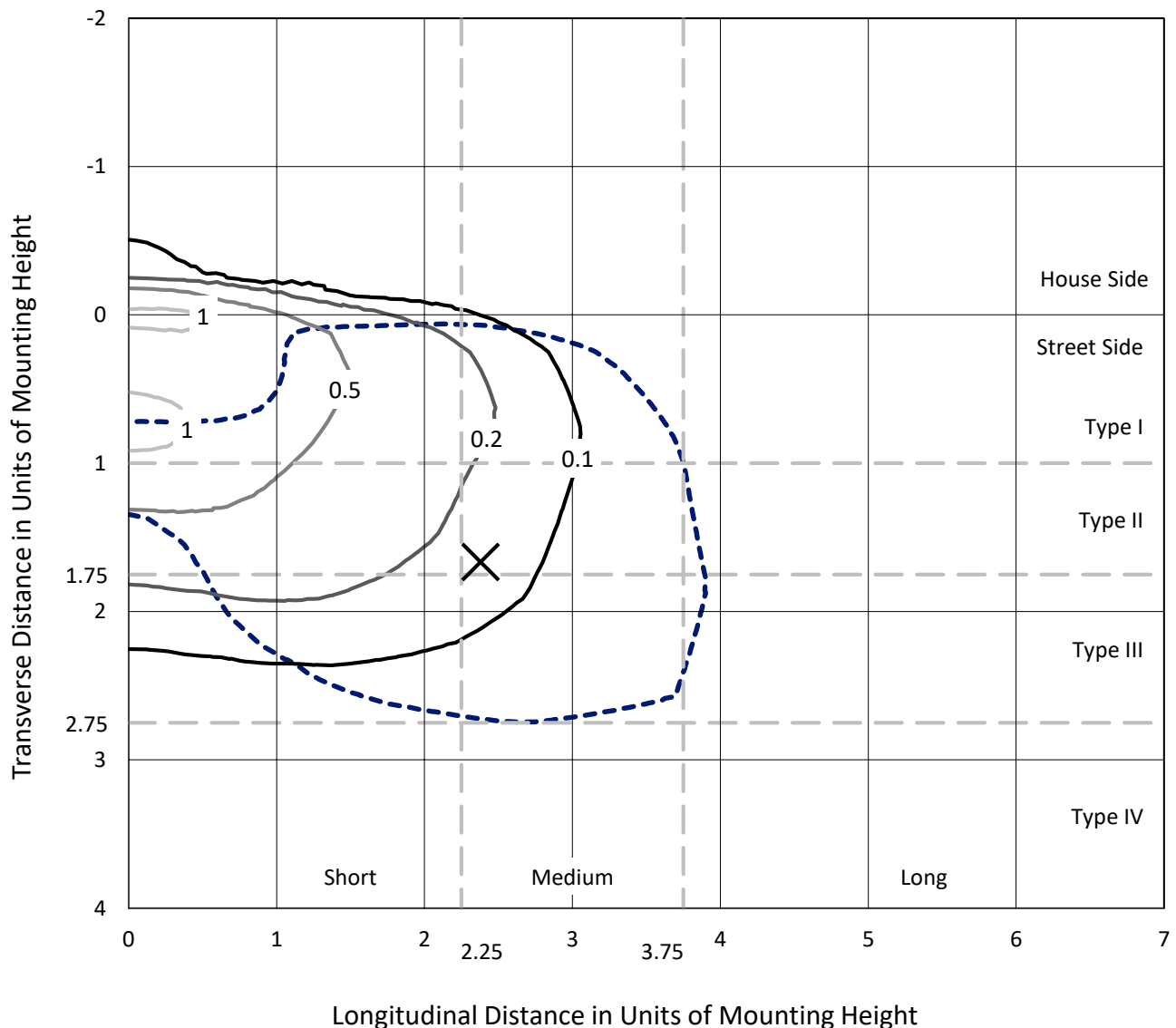
Input Watts (W): 44  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



REPORT NUMBER: P321755  
 CATALOG NUMBER: GLEON-SA1B-830-U-T3R-HSS

## Iso-Footcandle Lines of Horizontal Illumination

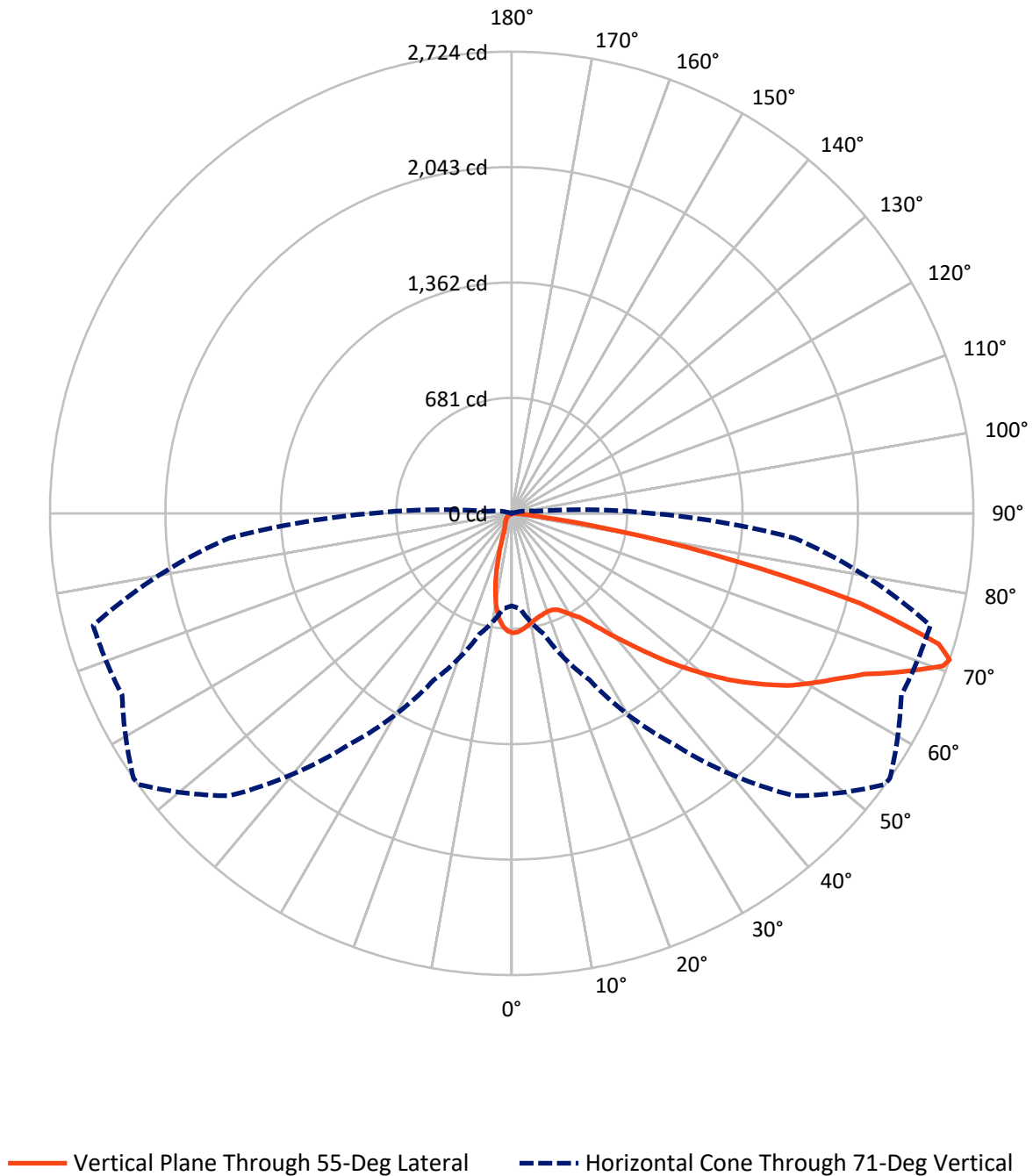
× Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 1.2 fc  
 Type III - Medium - N/A

REPORT NUMBER: P321755  
CATALOG NUMBER: GLEON-SA1B-830-U-T3R-HSS

## Luminous Intensity Polar Plot



REPORT NUMBER: P321755  
 CATALOG NUMBER: GLEON-SA1B-830-U-T3R-HSS

**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 289.5    | 0.0    | 289.5  |
|                    | % Fixture | 7.9      | 0.0    | 7.9    |
| <b>Street Side</b> | Lumens    | 3366.5   | 0.0    | 3366.5 |
|                    | % Fixture | 92.1     | 0.0    | 92.1   |
| <b>Total</b>       | Lumens    | 3656.0   | 0.0    | 3656.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 60.1   | 1.6       |
| 10°-20°   | 135.7  | 3.7       |
| 20°-30°   | 218.1  | 6.0       |
| 30°-40°   | 370.6  | 10.1      |
| 40°-50°   | 575.2  | 15.7      |
| 50°-60°   | 773.3  | 21.2      |
| 60°-70°   | 946.0  | 25.9      |
| 70°-80°   | 553.1  | 15.1      |
| 80°-90°   | 23.9   | 0.7       |
| 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°    | 3656.0 | 100.0     |
| 0°-180°   | 3656.0 | 100.0     |

**Coefficient of Utilization**



REPORT NUMBER: P321755

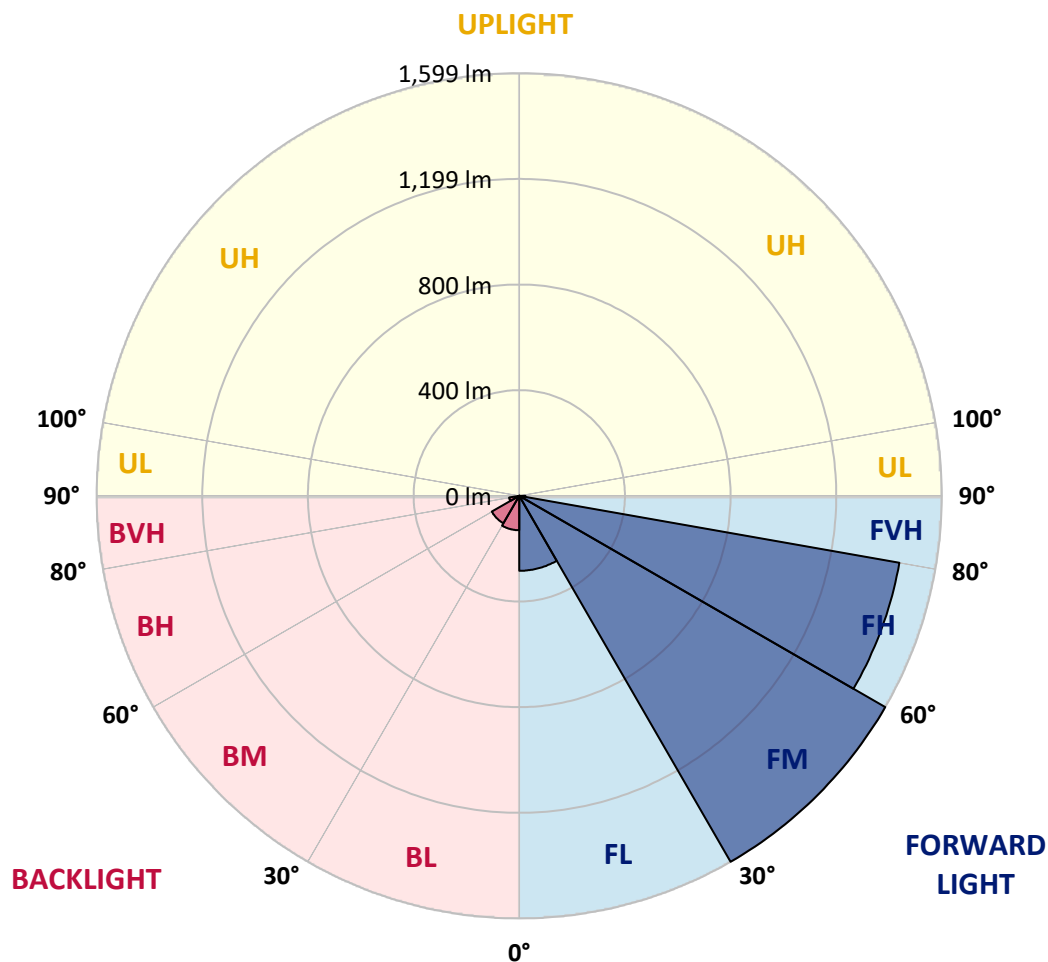
CATALOG NUMBER: GLEON-SA1B-830-U-T3R-HSS

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 283.7  | 7.8       |                         |      |         |
| FM   | (30°-60°)   | 1599.0 | 43.7      |                         |      |         |
| FH   | (60°-80°)   | 1460.3 | 39.9      |                         |      | G1/1800 |
| FVH  | (80°-90°)   | 23.5   | 0.6       |                         |      | G1/100  |
| BL   | (0°-30°)    | 130.3  | 3.6       | B1/500                  |      |         |
| BM   | (30°-60°)   | 120.0  | 3.3       | B0/220                  |      |         |
| BH   | (60°-80°)   | 38.8   | 1.1       | B0/110                  |      | G0/110  |
| BVH  | (80°-90°)   | 0.4    | 0.0       |                         |      | G0/10   |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B1-U0-G1**

Type III Medium





REPORT NUMBER: P321755

CATALOG NUMBER: GLEON-SA1B-830-U-T3R-HSS

**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 54°    | 55°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 705.1  | 705.1  | 705.1  | 705.1  | 705.1  | 705.1  | 705.1  | 705.1  | 705.1  | 705.1  | 705.1  |
| 2.5°  | 684.4  | 685.2  | 688.2  | 689.5  | 692.6  | 697.8  | 700.5  | 700.6  | 704.9  | 706.6  | 707.9  |
| 5°    | 636.0  | 640.9  | 645.8  | 651.1  | 660.6  | 673.2  | 685.7  | 686.9  | 700.6  | 710.8  | 716.2  |
| 7.5°  | 594.3  | 598.7  | 604.6  | 613.0  | 626.4  | 646.3  | 667.2  | 669.6  | 695.7  | 718.9  | 731.0  |
| 10°   | 551.4  | 555.0  | 563.6  | 575.9  | 594.4  | 621.0  | 649.1  | 653.2  | 691.3  | 729.7  | 751.0  |
| 12.5° | 505.6  | 507.8  | 518.1  | 535.8  | 563.1  | 596.9  | 633.8  | 639.2  | 688.5  | 742.2  | 774.7  |
| 15°   | 470.8  | 471.8  | 481.6  | 500.0  | 531.2  | 575.2  | 622.0  | 628.6  | 689.1  | 757.1  | 800.5  |
| 17.5° | 461.9  | 462.4  | 467.7  | 480.3  | 507.9  | 555.9  | 612.6  | 620.7  | 691.1  | 771.7  | 826.4  |
| 20°   | 497.9  | 494.5  | 489.0  | 487.1  | 498.9  | 544.2  | 607.1  | 616.1  | 693.7  | 784.7  | 849.7  |
| 22.5° | 596.6  | 586.4  | 563.9  | 533.9  | 515.6  | 545.0  | 608.5  | 617.6  | 702.1  | 800.6  | 876.6  |
| 25°   | 743.0  | 728.9  | 690.6  | 631.5  | 574.7  | 568.7  | 620.9  | 630.1  | 718.4  | 819.7  | 902.4  |
| 27.5° | 909.6  | 895.7  | 848.9  | 764.5  | 667.6  | 615.4  | 649.1  | 657.6  | 742.5  | 836.6  | 922.1  |
| 30°   | 1069.2 | 1065.2 | 1010.1 | 914.2  | 784.5  | 691.3  | 685.5  | 692.8  | 760.4  | 846.7  | 937.7  |
| 32.5° | 1204.5 | 1198.2 | 1153.9 | 1060.6 | 918.3  | 782.4  | 728.4  | 730.5  | 773.9  | 859.9  | 958.0  |
| 35°   | 1329.9 | 1322.2 | 1283.2 | 1195.1 | 1055.6 | 893.7  | 794.4  | 791.3  | 803.2  | 886.3  | 987.6  |
| 37.5° | 1439.4 | 1446.4 | 1403.3 | 1319.4 | 1178.7 | 1009.4 | 883.4  | 874.0  | 849.2  | 929.3  | 1030.4 |
| 40°   | 1531.0 | 1531.0 | 1508.5 | 1438.5 | 1311.6 | 1129.1 | 984.0  | 971.7  | 918.3  | 995.6  | 1084.8 |
| 42.5° | 1564.0 | 1571.0 | 1579.4 | 1539.8 | 1430.7 | 1253.5 | 1096.1 | 1083.3 | 1015.7 | 1089.7 | 1153.4 |
| 45°   | 1565.9 | 1577.1 | 1619.9 | 1619.8 | 1538.2 | 1377.1 | 1222.5 | 1216.4 | 1140.4 | 1210.5 | 1238.4 |
| 47.5° | 1538.2 | 1552.1 | 1622.7 | 1662.8 | 1623.4 | 1492.2 | 1360.7 | 1353.2 | 1287.0 | 1358.6 | 1327.4 |
| 50°   | 1495.3 | 1510.8 | 1592.9 | 1679.7 | 1681.3 | 1592.4 | 1506.3 | 1495.0 | 1448.4 | 1527.8 | 1419.3 |
| 52.5° | 1418.7 | 1448.6 | 1566.1 | 1683.6 | 1719.4 | 1678.9 | 1644.9 | 1640.0 | 1629.0 | 1690.9 | 1492.6 |
| 55°   | 1254.7 | 1287.8 | 1499.0 | 1685.0 | 1754.7 | 1755.5 | 1774.7 | 1776.1 | 1798.2 | 1843.2 | 1547.1 |
| 57.5° | 1177.2 | 1195.9 | 1381.7 | 1691.2 | 1807.1 | 1842.5 | 1907.1 | 1917.2 | 1951.5 | 1987.8 | 1609.3 |
| 60°   | 1128.4 | 1150.6 | 1324.0 | 1682.7 | 1889.3 | 1956.6 | 2029.7 | 2033.1 | 2069.9 | 2137.1 | 1693.5 |
| 62.5° | 1089.5 | 1111.4 | 1287.5 | 1649.8 | 1981.8 | 2093.9 | 2149.5 | 2149.9 | 2177.4 | 2314.8 | 1789.2 |
| 65°   | 993.5  | 1011.9 | 1213.8 | 1612.9 | 2042.8 | 2229.6 | 2288.7 | 2286.6 | 2309.1 | 2502.3 | 1900.3 |
| 67.5° | 854.6  | 868.7  | 1063.3 | 1472.9 | 2019.8 | 2353.1 | 2498.9 | 2491.8 | 2464.6 | 2664.3 | 1944.0 |
| 70°   | 660.7  | 665.8  | 838.0  | 1227.4 | 1804.5 | 2400.5 | 2701.9 | 2698.3 | 2559.9 | 2635.3 | 1783.9 |
| 71°   | 546.2  | 562.9  | 738.6  | 1083.3 | 1660.2 | 2356.7 | 2721.6 | 2723.8 | 2536.0 | 2556.2 | 1673.8 |
| 72.5° | 317.2  | 331.4  | 535.3  | 832.0  | 1409.5 | 2173.8 | 2619.5 | 2635.0 | 2424.0 | 2325.0 | 1429.7 |
| 75°   | 68.0   | 72.7   | 198.5  | 402.7  | 775.3  | 1523.6 | 2067.6 | 2122.6 | 1975.7 | 1581.7 | 861.7  |
| 77.5° | 47.3   | 51.1   | 85.0   | 182.7  | 256.3  | 752.8  | 1284.4 | 1346.5 | 1180.3 | 594.4  | 275.8  |
| 80°   | 37.4   | 41.7   | 66.3   | 90.3   | 69.3   | 242.8  | 601.7  | 639.6  | 393.7  | 132.6  | 46.5   |
| 82.5° | 20.8   | 24.8   | 51.7   | 48.8   | 26.6   | 46.1   | 168.4  | 190.4  | 78.8   | 26.8   | 11.0   |
| 85°   | 6.1    | 7.4    | 33.3   | 35.5   | 11.3   | 8.9    | 28.7   | 35.6   | 14.9   | 7.1    | 4.9    |
| 87.5° | 0.0    | 0.0    | 16.1   | 13.6   | 3.3    | 1.3    | 2.6    | 3.0    | 3.0    | 3.0    | 3.3    |
| 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: P321755

CATALOG NUMBER: GLEON-SA1B-830-U-T3R-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°   | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 705.1  | 705.1 | 705.1 | 705.1 | 705.1 | 705.1 | 705.1 | 705.1 | 705.1 | 705.1 | 705.1 |
| 2.5°  | 707.9  | 709.0 | 704.9 | 699.5 | 693.7 | 686.7 | 679.3 | 673.6 | 673.4 | 670.6 | 667.8 |
| 5°    | 716.6  | 715.9 | 704.6 | 687.3 | 667.0 | 645.8 | 625.6 | 602.8 | 595.2 | 585.9 | 582.8 |
| 7.5°  | 732.7  | 728.1 | 704.1 | 666.3 | 621.7 | 577.4 | 531.6 | 485.4 | 465.7 | 448.0 | 444.9 |
| 10°   | 752.8  | 744.1 | 701.0 | 634.8 | 552.9 | 471.1 | 402.0 | 339.3 | 311.7 | 290.6 | 289.6 |
| 12.5° | 773.9  | 760.6 | 692.3 | 587.2 | 462.8 | 347.9 | 268.2 | 206.5 | 183.5 | 168.8 | 170.1 |
| 15°   | 795.9  | 776.0 | 673.6 | 523.0 | 360.2 | 236.1 | 164.8 | 128.5 | 119.3 | 115.6 | 116.6 |
| 17.5° | 818.3  | 786.7 | 647.5 | 445.7 | 258.9 | 152.3 | 114.1 | 103.9 | 103.9 | 104.7 | 105.1 |
| 20°   | 837.9  | 792.4 | 609.0 | 359.0 | 175.5 | 111.0 | 99.8  | 98.3  | 99.2  | 100.5 | 100.6 |
| 22.5° | 857.3  | 792.7 | 559.0 | 271.2 | 122.8 | 97.2  | 95.0  | 94.4  | 94.9  | 96.4  | 96.5  |
| 25°   | 873.0  | 788.8 | 496.3 | 192.9 | 98.0  | 91.6  | 90.6  | 90.3  | 90.6  | 92.4  | 92.4  |
| 27.5° | 879.4  | 774.5 | 419.8 | 135.6 | 87.8  | 85.4  | 85.0  | 85.4  | 85.9  | 87.2  | 87.3  |
| 30°   | 880.1  | 749.6 | 336.4 | 98.2  | 79.6  | 77.0  | 77.6  | 78.8  | 78.3  | 78.0  | 78.3  |
| 32.5° | 881.7  | 720.7 | 255.1 | 80.8  | 72.7  | 68.6  | 67.8  | 67.8  | 65.8  | 64.7  | 64.0  |
| 35°   | 887.1  | 686.7 | 185.0 | 72.6  | 65.7  | 60.9  | 57.8  | 54.2  | 50.4  | 48.4  | 47.9  |
| 37.5° | 895.7  | 651.1 | 132.5 | 67.1  | 59.4  | 54.0  | 48.1  | 41.7  | 36.3  | 34.8  | 34.8  |
| 40°   | 911.3  | 614.3 | 98.0  | 62.9  | 54.5  | 47.8  | 38.9  | 30.5  | 25.6  | 24.8  | 24.8  |
| 42.5° | 935.9  | 575.5 | 78.1  | 59.1  | 50.2  | 41.4  | 29.7  | 22.2  | 18.6  | 18.1  | 17.9  |
| 45°   | 961.5  | 532.9 | 68.3  | 55.5  | 45.6  | 34.0  | 22.0  | 16.4  | 14.3  | 13.8  | 13.8  |
| 47.5° | 987.1  | 487.4 | 63.5  | 52.0  | 41.2  | 26.4  | 16.4  | 13.0  | 12.0  | 12.0  | 12.1  |
| 50°   | 1008.8 | 440.0 | 60.1  | 48.3  | 35.5  | 20.0  | 13.0  | 11.0  | 10.7  | 11.3  | 11.5  |
| 52.5° | 1014.2 | 393.3 | 55.8  | 43.5  | 28.4  | 15.3  | 10.7  | 9.7   | 9.7   | 9.7   | 9.7   |
| 55°   | 1010.9 | 357.2 | 50.2  | 37.6  | 21.0  | 12.1  | 9.2   | 8.5   | 8.4   | 8.4   | 8.4   |
| 57.5° | 1022.1 | 335.9 | 40.2  | 29.2  | 15.1  | 9.8   | 8.0   | 7.6   | 7.2   | 7.1   | 7.1   |
| 60°   | 1044.6 | 321.9 | 28.7  | 21.0  | 11.3  | 8.2   | 6.9   | 6.4   | 5.9   | 5.6   | 5.6   |
| 62.5° | 1074.4 | 309.8 | 21.3  | 15.6  | 8.7   | 6.6   | 5.7   | 5.3   | 4.6   | 4.3   | 4.3   |
| 65°   | 1097.4 | 288.1 | 16.3  | 11.7  | 6.6   | 5.3   | 4.4   | 4.3   | 3.3   | 3.0   | 2.8   |
| 67.5° | 1062.3 | 240.5 | 13.1  | 8.5   | 4.9   | 4.1   | 3.4   | 3.3   | 2.0   | 1.6   | 1.6   |
| 70°   | 911.1  | 167.4 | 10.5  | 6.2   | 3.6   | 3.3   | 2.8   | 2.1   | 1.5   | 1.3   | 1.3   |
| 71°   | 826.2  | 139.9 | 9.5   | 5.3   | 3.1   | 3.1   | 2.6   | 1.8   | 1.3   | 1.1   | 1.1   |
| 72.5° | 686.4  | 99.3  | 8.0   | 4.1   | 2.8   | 3.3   | 2.8   | 1.6   | 1.3   | 1.1   | 1.0   |
| 75°   | 398.4  | 41.5  | 5.6   | 2.8   | 2.1   | 3.9   | 3.6   | 1.5   | 1.0   | 0.8   | 0.8   |
| 77.5° | 119.8  | 15.3  | 3.1   | 1.8   | 1.6   | 3.4   | 4.1   | 1.3   | 0.5   | 0.2   | 0.2   |
| 80°   | 21.8   | 6.6   | 2.0   | 1.1   | 1.1   | 2.1   | 3.1   | 0.7   | 0.0   | 0.0   | 0.0   |
| 82.5° | 7.7    | 3.3   | 1.1   | 0.7   | 0.5   | 1.0   | 1.5   | 0.0   | 0.0   | 0.0   | 0.0   |
| 85°   | 4.4    | 2.3   | 0.7   | 0.3   | 0.0   | 0.2   | 0.3   | 0.0   | 0.0   | 0.0   | 0.0   |
| 87.5° | 3.0    | 0.7   | 0.0   | 0.0   | 0.0   | 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-79-2019: 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  
 Rf: 81.5  
 Rg: 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<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(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<br>(nm) | Power<br>W <sup>Λ</sup> /nm | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>W <sup>Λ</sup> /nm | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>W <sup>Λ</sup> /nm | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>W <sup>Λ</sup> /nm | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>W <sup>Λ</sup> /nm | Lumens<br>(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)