

Signify Classified - Internal  
Cooper Lighting Solutions Photometric Lab  
1121 Highway 74 South  
Peachtree City, GA 30269



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: P385604

Luminaire Tested: **GPC-SA1A-830-U-SL4-HSS**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P385604  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-25)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GPC-SA1A-830-U-SL4-HSS  
Description: GALLEON PEDESTRIAN LUMINAIRE  
(1) 80 CRI, 3000K, 615mA LIGHTSQUARE WITH 16 LEDS AND TYPE IV SPILL LIGHT  
ELIMINATOR OPTICS WITH HOUSE SIDE SHIELD  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

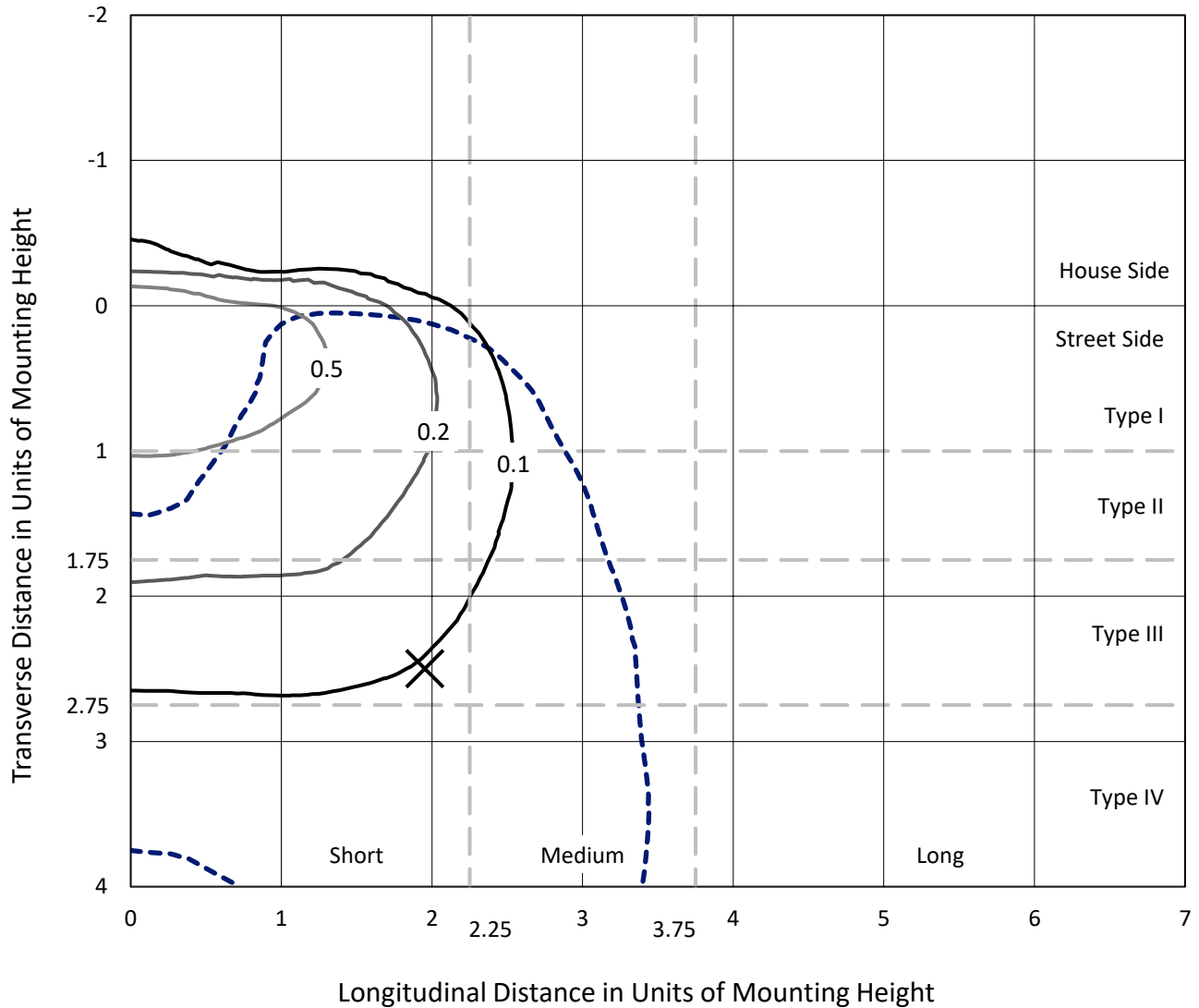
Lumens per Lamp: N/A  
Luminaire Lumens: 3210 lumens  
Efficiency: N/A  
Efficacy: 94.4 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 0.5' x H: 0')  
IES Classification: Type IV - Short  
BUG Rating: B0 - U0 - G1  
  
Input Watts (W): 34  
Input Voltage (V): NR  
Input Current (Ain): NR  
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: 28.75 FT



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### Iso-Footcandle Lines of Horizontal Illumination

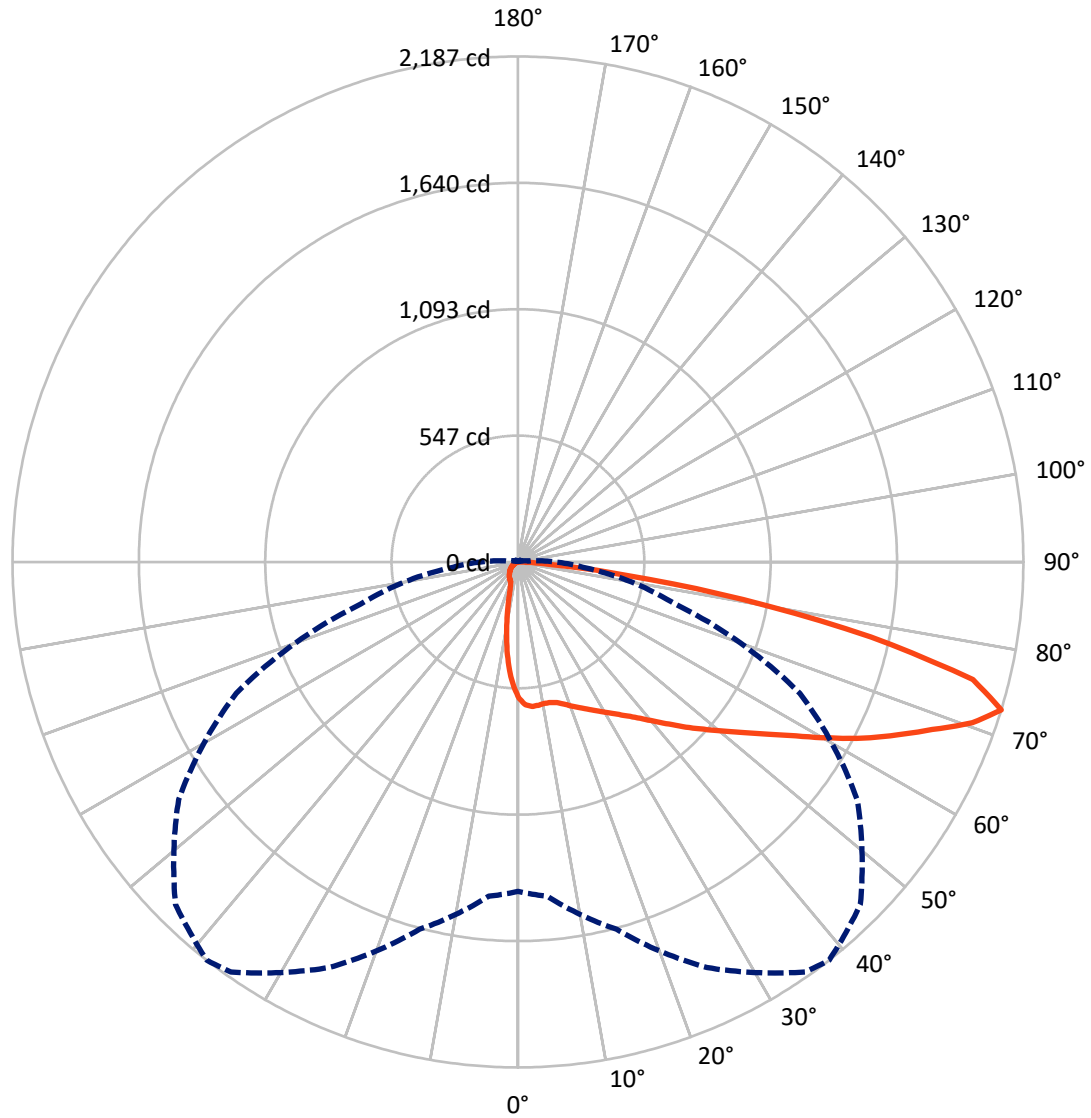
× Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 1 fc  
 Type IV - Short - N/A

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### Luminous Intensity Polar Plot



— Vertical Plane Through 38-Deg Lateral    - - - Horizontal Cone Through 72.5-Deg Vertical

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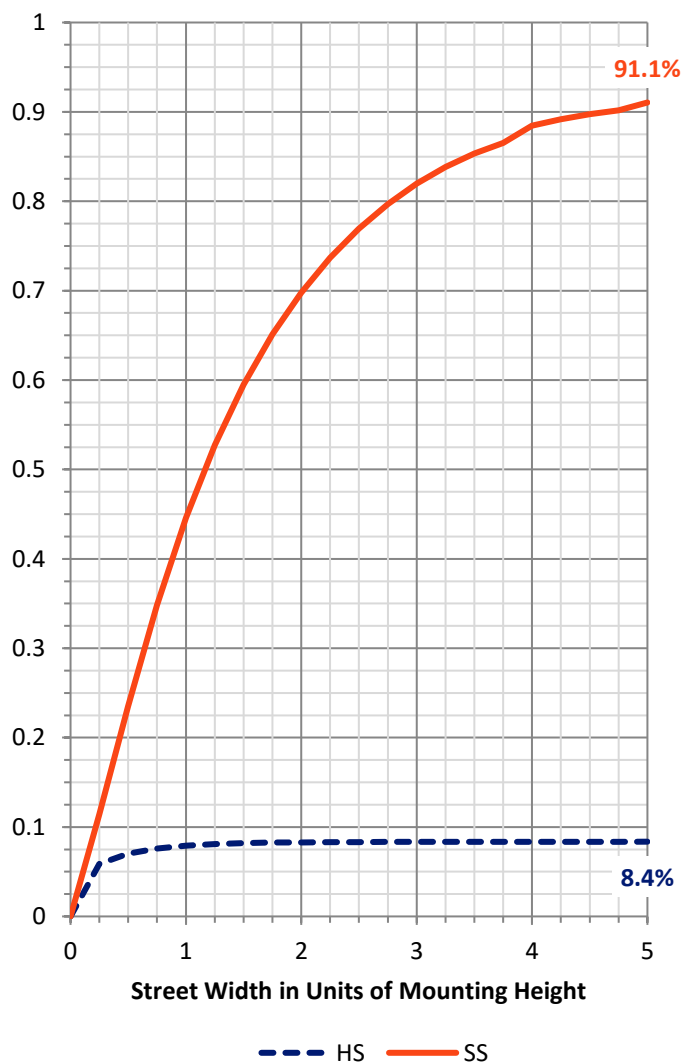
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 270.1    | 0.0    | 270.1  |
|                    | % Fixture | 8.4      | 0.0    | 8.4    |
| <b>Street Side</b> | Lumens    | 2939.9   | 0.0    | 2939.9 |
|                    | % Fixture | 91.6     | 0.0    | 91.6   |
| <b>Total</b>       | Lumens    | 3210.0   | 0.0    | 3210.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 50.3   | 1.6       |
| 10°-20°   | 123.0  | 3.8       |
| 20°-30°   | 195.6  | 6.1       |
| 30°-40°   | 294.1  | 9.2       |
| 40°-50°   | 448.7  | 14.0      |
| 50°-60°   | 634.2  | 19.8      |
| 60°-70°   | 795.5  | 24.8      |
| 70°-80°   | 594.8  | 18.5      |
| 80°-90°   | 73.8   | 2.3       |
| 90°-100°  | 0.0    | 0.0       |
| 100°-110° | 0.0    | 0.0       |
| 110°-120° | 0.0    | 0.0       |
| 120°-130° | 0.0    | 0.0       |
| 130°-140° | 0.0    | 0.0       |
| 140°-150° | 0.0    | 0.0       |
| 150°-160° | 0.0    | 0.0       |
| 160°-170° | 0.0    | 0.0       |
| 170°-180° | 0.0    | 0.0       |
| 0°-90°    | 3210.0 | 100.0     |
| 0°-180°   | 3210.0 | 100.0     |

**Coefficient of Utilization**



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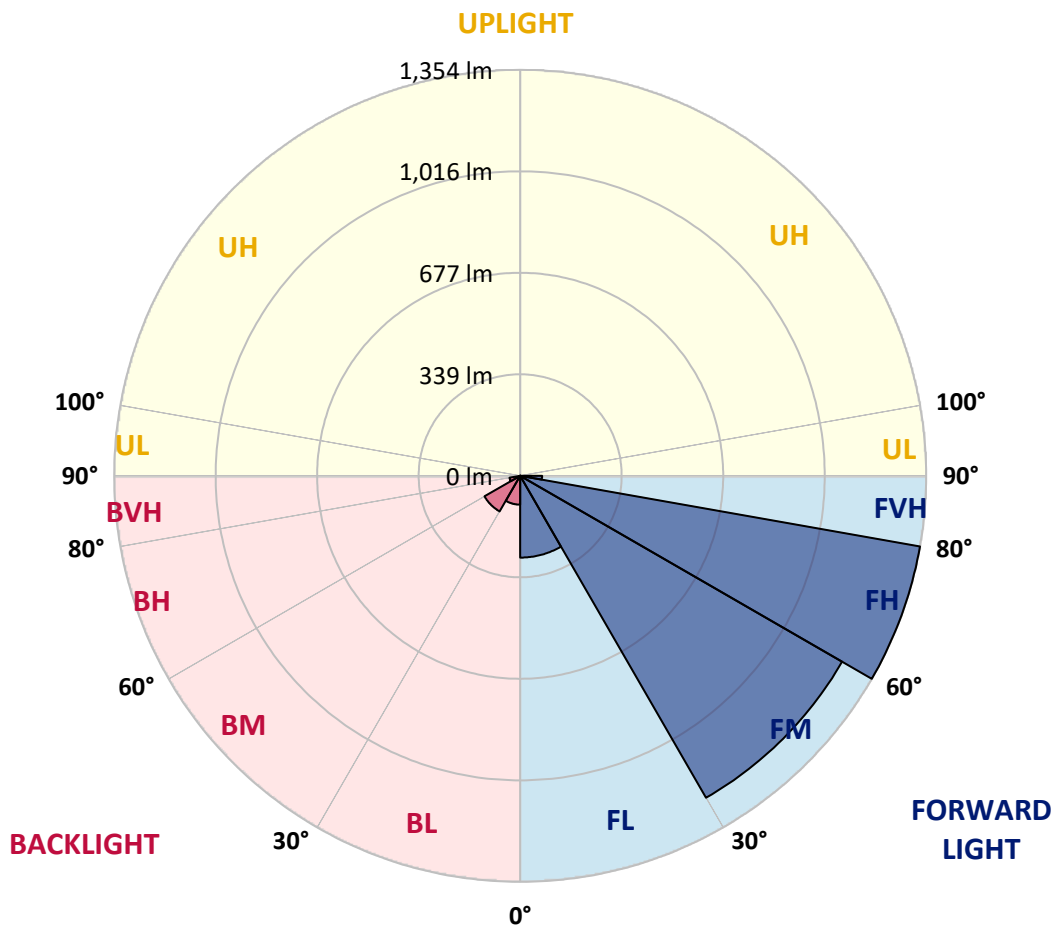
CATALOG NUMBER: GPC-SA1A-830-U-SL4-HSS

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

| Zone           | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|----------------|--------|-----------|-------------------------|------|---------|
|                |        |           | B                       | U    | G       |
| FL (0°-30°)    | 272.8  | 8.5       |                         |      |         |
| FM (30°-60°)   | 1239.8 | 38.6      |                         |      |         |
| FH (60°-80°)   | 1354.2 | 42.2      |                         |      | G1/1800 |
| FVH (80°-90°)  | 73.1   | 2.3       |                         |      | G1/100  |
| BL (0°-30°)    | 96.2   | 3.0       | B0/110                  |      |         |
| BM (30°-60°)   | 137.2  | 4.3       | B0/220                  |      |         |
| BH (60°-80°)   | 36.1   | 1.1       | B0/110                  |      | G0/110  |
| BVH (80°-90°)  | 0.7    | 0.0       |                         |      | G0/10   |
| UL (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B0-U0-G1**

Type IV Short





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 38°    | 45°    | 55°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 590.3  | 590.3  | 590.3  | 590.3  | 590.3  | 590.3  | 590.3  | 590.3  | 590.3  | 590.3  | 590.3  |
| 2.5°  | 626.6  | 626.7  | 625.2  | 622.8  | 619.8  | 618.2  | 615.5  | 611.2  | 606.7  | 598.6  | 589.8  |
| 5°    | 639.4  | 639.4  | 637.5  | 634.3  | 629.4  | 627.9  | 622.8  | 616.0  | 606.7  | 593.5  | 578.7  |
| 7.5°  | 638.0  | 638.3  | 635.8  | 632.4  | 627.5  | 626.2  | 620.0  | 612.4  | 600.8  | 584.8  | 565.9  |
| 10°   | 631.1  | 631.8  | 629.8  | 628.2  | 623.6  | 622.2  | 616.4  | 608.8  | 597.2  | 580.2  | 558.4  |
| 12.5° | 624.0  | 624.7  | 625.4  | 626.8  | 624.0  | 623.5  | 619.0  | 612.6  | 601.5  | 583.8  | 559.2  |
| 15°   | 619.5  | 620.8  | 625.6  | 631.4  | 632.0  | 631.5  | 628.6  | 622.6  | 611.4  | 593.0  | 565.0  |
| 17.5° | 619.5  | 621.6  | 631.6  | 642.6  | 646.4  | 646.8  | 644.3  | 635.9  | 622.6  | 602.8  | 570.3  |
| 20°   | 624.7  | 627.6  | 643.2  | 658.7  | 665.1  | 665.1  | 660.2  | 648.4  | 632.8  | 611.8  | 573.9  |
| 22.5° | 638.0  | 641.9  | 661.5  | 679.4  | 686.2  | 684.7  | 678.0  | 661.0  | 643.5  | 621.9  | 578.4  |
| 25°   | 664.3  | 667.2  | 687.6  | 705.6  | 709.8  | 706.4  | 698.0  | 676.2  | 657.1  | 635.6  | 586.7  |
| 27.5° | 698.2  | 698.6  | 719.6  | 734.8  | 732.3  | 730.0  | 719.5  | 695.2  | 676.7  | 655.2  | 601.0  |
| 30°   | 735.4  | 735.4  | 753.9  | 765.5  | 757.7  | 755.9  | 745.4  | 718.3  | 701.8  | 681.9  | 621.2  |
| 32.5° | 771.3  | 772.9  | 788.0  | 795.3  | 786.7  | 784.8  | 774.5  | 747.5  | 735.1  | 722.6  | 652.8  |
| 35°   | 806.1  | 807.3  | 821.6  | 825.6  | 817.3  | 817.9  | 810.5  | 787.6  | 782.9  | 781.3  | 700.4  |
| 37.5° | 839.9  | 840.1  | 854.7  | 857.2  | 853.1  | 857.6  | 858.3  | 838.0  | 846.7  | 859.6  | 767.5  |
| 40°   | 870.7  | 870.9  | 885.3  | 891.9  | 898.9  | 904.8  | 910.0  | 899.2  | 927.9  | 957.9  | 847.3  |
| 42.5° | 895.3  | 898.1  | 916.4  | 928.8  | 947.5  | 958.7  | 972.8  | 972.2  | 1024.5 | 1069.6 | 943.9  |
| 45°   | 917.1  | 921.9  | 947.3  | 969.0  | 1001.0 | 1018.9 | 1041.0 | 1058.4 | 1133.3 | 1193.9 | 1041.6 |
| 47.5° | 945.7  | 950.3  | 979.3  | 1014.9 | 1057.6 | 1081.0 | 1117.7 | 1155.2 | 1252.9 | 1316.1 | 1137.0 |
| 50°   | 986.1  | 984.1  | 1012.8 | 1063.8 | 1118.6 | 1149.4 | 1201.7 | 1257.8 | 1371.5 | 1422.4 | 1193.1 |
| 52.5° | 1029.2 | 1028.4 | 1049.6 | 1117.0 | 1190.6 | 1226.6 | 1295.7 | 1363.9 | 1485.0 | 1495.8 | 1218.9 |
| 55°   | 1082.5 | 1076.8 | 1094.6 | 1177.7 | 1276.1 | 1314.7 | 1396.1 | 1469.0 | 1575.4 | 1537.1 | 1231.8 |
| 57.5° | 1138.4 | 1128.9 | 1146.0 | 1245.3 | 1372.5 | 1418.2 | 1507.2 | 1571.4 | 1635.5 | 1565.4 | 1231.7 |
| 60°   | 1196.1 | 1184.9 | 1205.1 | 1329.8 | 1492.2 | 1545.1 | 1627.7 | 1640.5 | 1691.6 | 1579.6 | 1222.6 |
| 62.5° | 1244.3 | 1237.7 | 1267.8 | 1420.2 | 1625.9 | 1677.9 | 1718.8 | 1703.5 | 1738.9 | 1590.7 | 1201.4 |
| 65°   | 1295.4 | 1295.8 | 1344.5 | 1525.6 | 1768.0 | 1803.1 | 1806.5 | 1785.1 | 1778.5 | 1588.4 | 1129.7 |
| 67.5° | 1364.5 | 1370.9 | 1452.0 | 1668.8 | 1906.2 | 1933.3 | 1933.0 | 1873.4 | 1807.5 | 1498.3 | 970.6  |
| 70°   | 1437.5 | 1452.6 | 1576.0 | 1832.6 | 2057.1 | 2084.6 | 2070.5 | 1929.7 | 1701.9 | 1211.5 | 687.0  |
| 72.5° | 1425.2 | 1451.4 | 1644.9 | 1936.0 | 2165.5 | 2186.5 | 2094.6 | 1791.5 | 1345.1 | 704.2  | 292.5  |
| 75°   | 1099.6 | 1129.8 | 1508.3 | 1833.6 | 2051.8 | 2033.0 | 1799.7 | 1394.1 | 735.1  | 196.5  | 65.9   |
| 77.5° | 580.8  | 597.0  | 996.4  | 1396.8 | 1599.9 | 1560.6 | 1267.8 | 773.3  | 224.1  | 48.7   | 29.6   |
| 80°   | 304.2  | 308.0  | 434.2  | 792.5  | 987.4  | 987.7  | 751.4  | 339.7  | 92.4   | 24.9   | 19.9   |
| 82.5° | 162.9  | 166.1  | 229.4  | 366.2  | 517.4  | 469.0  | 287.7  | 186.9  | 53.7   | 14.1   | 19.1   |
| 85°   | 39.2   | 39.9   | 130.1  | 167.3  | 203.4  | 145.3  | 85.5   | 156.9  | 14.5   | 8.3    | 15.5   |
| 87.5° | 15.1   | 15.3   | 48.3   | 72.4   | 51.9   | 33.6   | 40.0   | 58.5   | 1.9    | 3.2    | 2.4    |
| 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: P385604  
 CATALOG NUMBER: GPC-SA1A-830-U-SL4-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°   | 95°   | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 590.3 | 590.3 | 590.3 | 590.3 | 590.3 | 590.3 | 590.3 | 590.3 | 590.3 | 590.3 | 590.3 |
| 2.5°  | 584.4 | 581.0 | 572.4 | 561.6 | 552.0 | 545.1 | 534.7 | 527.9 | 523.4 | 523.3 | 521.5 |
| 5°    | 569.6 | 562.6 | 544.2 | 522.3 | 502.5 | 484.6 | 463.5 | 446.9 | 434.5 | 432.5 | 428.2 |
| 7.5°  | 553.8 | 542.2 | 513.9 | 479.8 | 446.5 | 412.6 | 373.3 | 348.9 | 327.9 | 318.0 | 316.9 |
| 10°   | 544.0 | 527.8 | 487.7 | 438.3 | 386.1 | 331.0 | 279.6 | 244.0 | 218.2 | 210.9 | 205.4 |
| 12.5° | 542.0 | 520.6 | 467.4 | 399.4 | 324.7 | 252.0 | 195.0 | 157.2 | 136.6 | 130.1 | 128.4 |
| 15°   | 544.0 | 517.3 | 450.3 | 360.9 | 262.6 | 178.8 | 130.9 | 108.9 | 101.2 | 99.3  | 99.2  |
| 17.5° | 545.2 | 513.3 | 431.0 | 318.1 | 202.4 | 127.7 | 100.3 | 93.9  | 92.7  | 92.5  | 92.8  |
| 20°   | 545.1 | 507.1 | 407.9 | 270.4 | 150.5 | 100.4 | 90.7  | 89.3  | 89.1  | 89.2  | 89.1  |
| 22.5° | 544.2 | 499.9 | 382.6 | 221.2 | 113.7 | 89.7  | 86.5  | 85.7  | 85.6  | 85.6  | 85.6  |
| 25°   | 545.9 | 494.2 | 354.7 | 174.1 | 93.7  | 84.8  | 82.8  | 82.1  | 82.0  | 82.0  | 81.7  |
| 27.5° | 552.2 | 491.0 | 324.2 | 134.0 | 84.7  | 80.4  | 78.8  | 78.7  | 78.3  | 78.1  | 78.4  |
| 30°   | 562.3 | 491.0 | 290.8 | 104.3 | 79.2  | 75.9  | 74.7  | 74.4  | 74.3  | 74.1  | 74.3  |
| 32.5° | 580.2 | 494.7 | 254.2 | 86.7  | 74.0  | 70.8  | 70.0  | 70.4  | 70.0  | 70.0  | 70.0  |
| 35°   | 612.4 | 505.9 | 216.0 | 75.6  | 68.5  | 65.9  | 65.1  | 65.6  | 65.3  | 65.3  | 65.2  |
| 37.5° | 659.5 | 526.7 | 177.4 | 68.9  | 63.7  | 60.9  | 59.9  | 60.7  | 60.4  | 60.4  | 60.3  |
| 40°   | 716.8 | 557.0 | 140.8 | 63.9  | 59.1  | 56.1  | 55.2  | 55.6  | 54.9  | 54.9  | 55.2  |
| 42.5° | 787.6 | 595.4 | 108.8 | 58.9  | 54.4  | 51.6  | 51.1  | 50.7  | 49.5  | 48.8  | 48.9  |
| 45°   | 866.3 | 635.4 | 84.8  | 54.1  | 50.0  | 47.7  | 46.9  | 45.9  | 43.9  | 42.5  | 42.7  |
| 47.5° | 936.5 | 666.2 | 68.9  | 49.5  | 46.0  | 44.3  | 43.1  | 41.1  | 38.1  | 36.5  | 36.7  |
| 50°   | 973.4 | 670.8 | 58.7  | 44.8  | 42.3  | 40.5  | 38.8  | 35.7  | 32.3  | 30.5  | 30.4  |
| 52.5° | 982.9 | 649.0 | 51.1  | 40.5  | 38.5  | 36.5  | 34.3  | 30.1  | 26.3  | 24.4  | 24.1  |
| 55°   | 986.4 | 615.6 | 44.3  | 36.5  | 34.5  | 32.3  | 29.3  | 24.7  | 21.1  | 19.2  | 19.1  |
| 57.5° | 974.9 | 565.9 | 38.9  | 32.9  | 30.5  | 27.7  | 24.1  | 19.7  | 16.3  | 14.8  | 14.8  |
| 60°   | 949.5 | 498.6 | 34.8  | 29.1  | 26.4  | 23.2  | 19.5  | 15.3  | 12.1  | 10.9  | 10.9  |
| 62.5° | 898.7 | 411.4 | 30.9  | 25.1  | 22.5  | 19.2  | 15.7  | 11.6  | 8.5   | 7.9   | 8.0   |
| 65°   | 802.8 | 312.1 | 27.1  | 21.5  | 19.2  | 15.9  | 12.3  | 8.3   | 5.7   | 5.7   | 6.0   |
| 67.5° | 654.7 | 216.8 | 23.1  | 18.3  | 16.5  | 12.9  | 9.3   | 5.7   | 4.0   | 4.5   | 5.1   |
| 70°   | 433.4 | 121.6 | 19.7  | 15.1  | 14.1  | 10.3  | 6.9   | 3.9   | 3.2   | 4.3   | 5.2   |
| 72.5° | 163.6 | 47.3  | 16.5  | 12.1  | 12.3  | 7.9   | 4.9   | 2.9   | 2.9   | 4.7   | 6.1   |
| 75°   | 45.6  | 23.2  | 11.9  | 8.9   | 9.6   | 5.7   | 3.6   | 2.5   | 2.8   | 5.3   | 7.2   |
| 77.5° | 26.8  | 17.1  | 7.7   | 5.2   | 6.5   | 4.0   | 2.4   | 2.0   | 2.4   | 4.5   | 6.9   |
| 80°   | 21.6  | 9.1   | 4.5   | 2.7   | 3.6   | 2.3   | 1.6   | 1.2   | 0.7   | 1.7   | 3.6   |
| 82.5° | 21.6  | 5.5   | 2.1   | 1.9   | 1.9   | 1.2   | 0.8   | 0.5   | 0.1   | 0.0   | 0.9   |
| 85°   | 14.5  | 2.3   | 1.3   | 1.2   | 0.9   | 0.4   | 0.3   | 0.1   | 0.0   | 0.0   | 0.0   |
| 87.5° | 2.4   | 0.9   | 0.5   | 0.3   | 0.1   | 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   |



Cooper Lighting Solutions Photometric Lab  
1121 Highway 74 South  
Peachtree City, GA 30269



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: 4π  
 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 | R9:  | 7.1  |
| R2:       | 85.6 | R10: | 67.0 |
| R3:       | 92.0 | R11: | 82.7 |
| R4:       | 82.6 | R12: | 63.2 |
| R5:       | 78.9 | R13: | 80.3 |
| R6:       | 81.7 | R14: | 95.0 |
| R7:       | 85.2 | R15: | 71.7 |
| R8:       | 62.0 |      |      |



**Test Conditions**

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

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| 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           |

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CIE 1931 Chromaticity Diagram



CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles



Point lies inside the ANSI 3000K 4-step quadrangle

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**Photopic Flux vs. Wavelength**



**Photopic Lumens: NR**

| $\lambda$<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>( $\phi$ /nm) | $\lambda$<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>( $\phi$ /nm) | $\lambda$<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>( $\phi$ /nm) | $\lambda$<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>( $\phi$ /nm) | $\lambda$<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>( $\phi$ /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                      |                   |                             |                         |

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**Scotopic Flux vs. Wavelength**



**Scotopic Lumens: NR**

**S/P: 1.27**

| $\lambda$ (nm) | Power W <sup>^</sup> /nm | Lumens ( $\phi$ /nm) | $\lambda$ (nm) | Power W <sup>^</sup> /nm | Lumens ( $\phi$ /nm) | $\lambda$ (nm) | Power W <sup>^</sup> /nm | Lumens ( $\phi$ /nm) | $\lambda$ (nm) | Power W <sup>^</sup> /nm | Lumens ( $\phi$ /nm) | $\lambda$ (nm) | Power W <sup>^</sup> /nm | Lumens ( $\phi$ /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                   |                |                          |                      |

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**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: NR**

**M/P: 2.32**

| λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</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            |        |                          |               |

**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)