

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: P386517

Luminaire Tested: **GPC-SA2A-830-U-T4W**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P386517  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-18)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GPC-SA2A-830-U-T4W  
Description: GALLEON PEDESTRIAN LUMINAIRE  
(2) 80 CRI, 3000K, 615mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE IV WIDE OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 7675 lumens  
Efficiency: N/A  
Efficacy: 116.3 lumens/watt  
Luminous Opening: Rectangular (W 1' x L: 0.5' x H: 0')  
IES Classification: Type IV - Short  
BUG Rating: B2 - U0 - G2

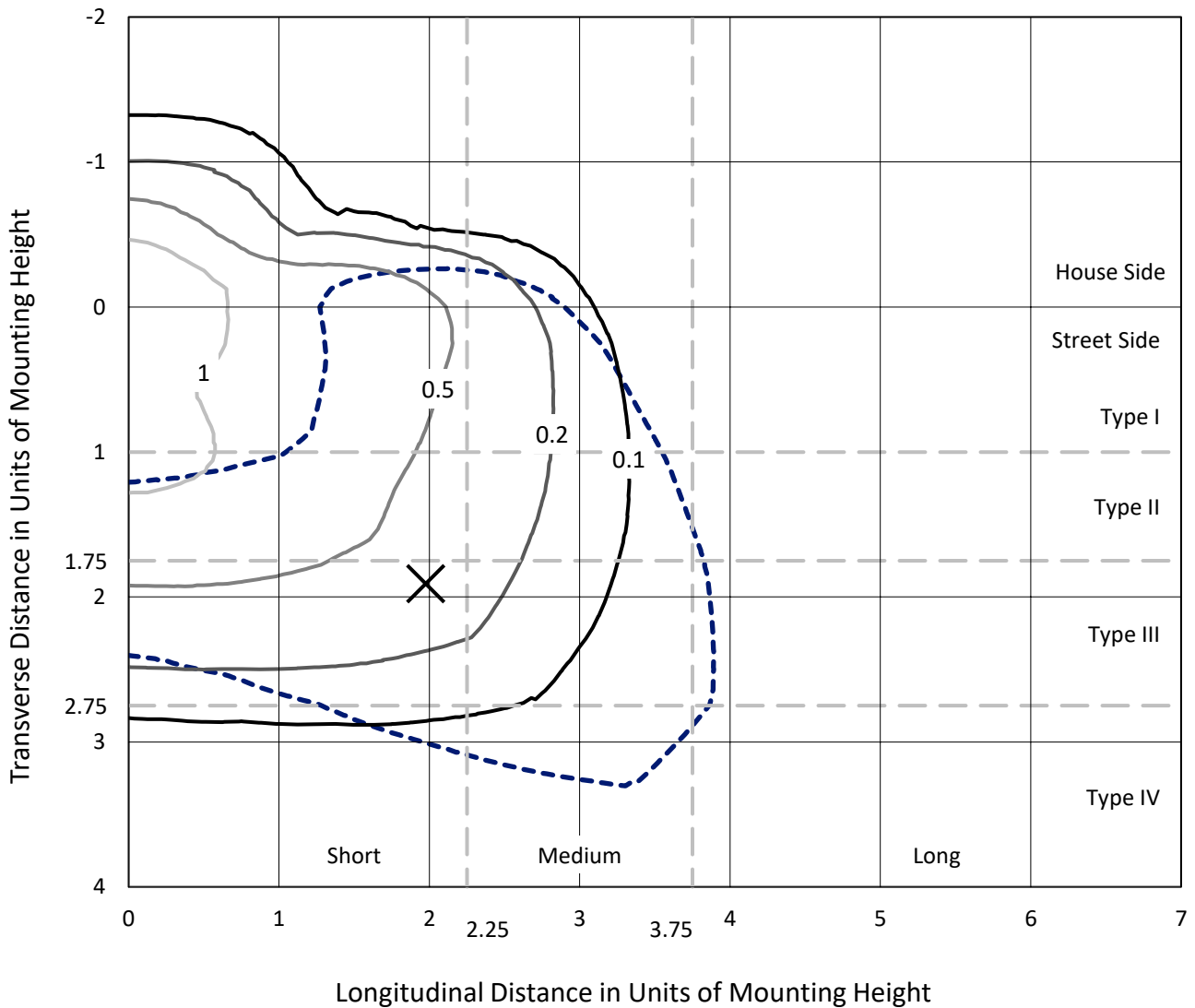
Input Watts (W): 66  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 28.75 FT



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 CATALOG NUMBER: GPC-SA2A-830-U-T4W

### Iso-Footcandle Lines of Horizontal Illumination

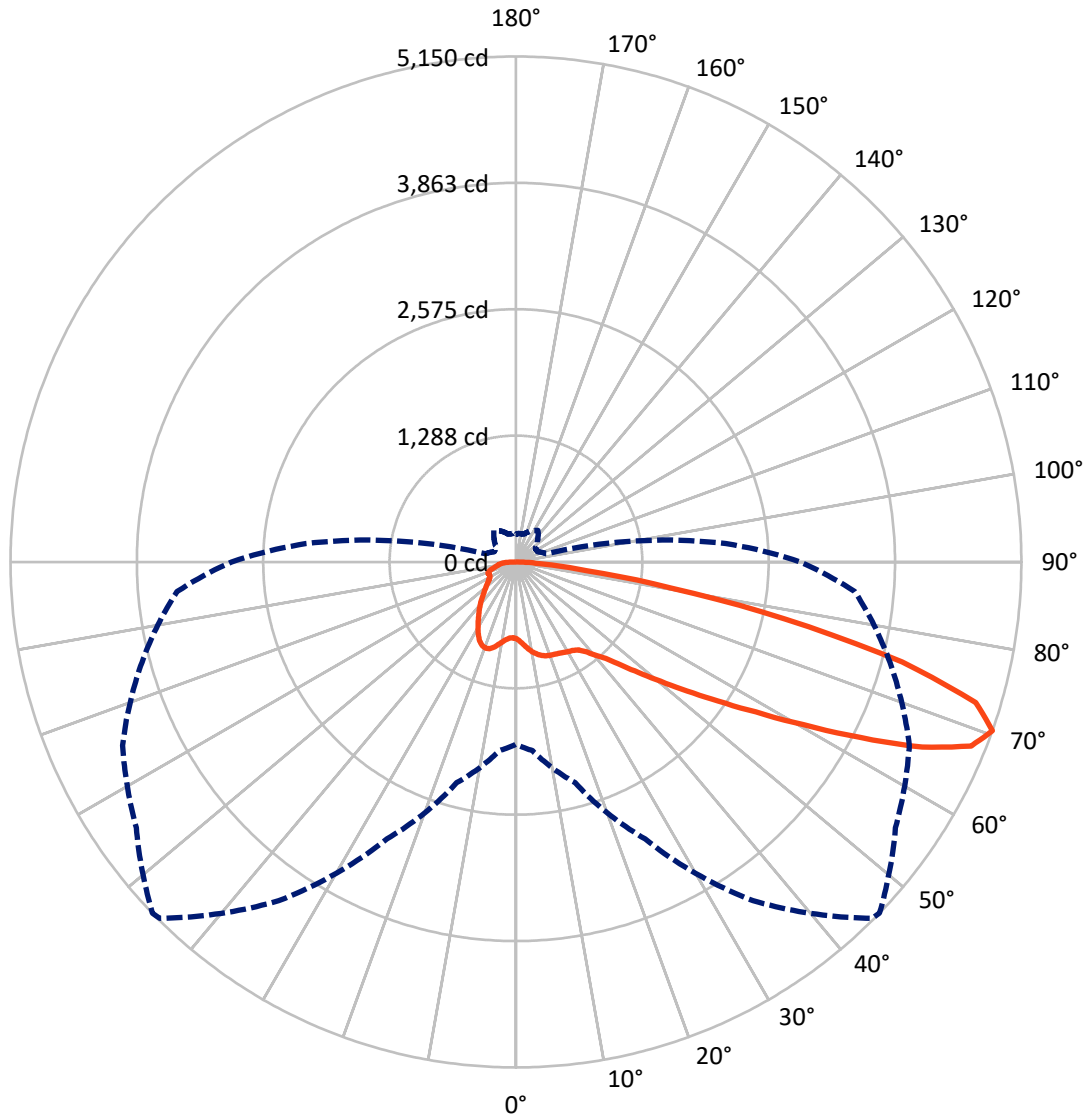
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 1.6 fc  
 Type IV - Short - N/A

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### Luminous Intensity Polar Plot



— Vertical Plane Through 46-Deg Lateral      - - - Horizontal Cone Through 70-Deg Vertical

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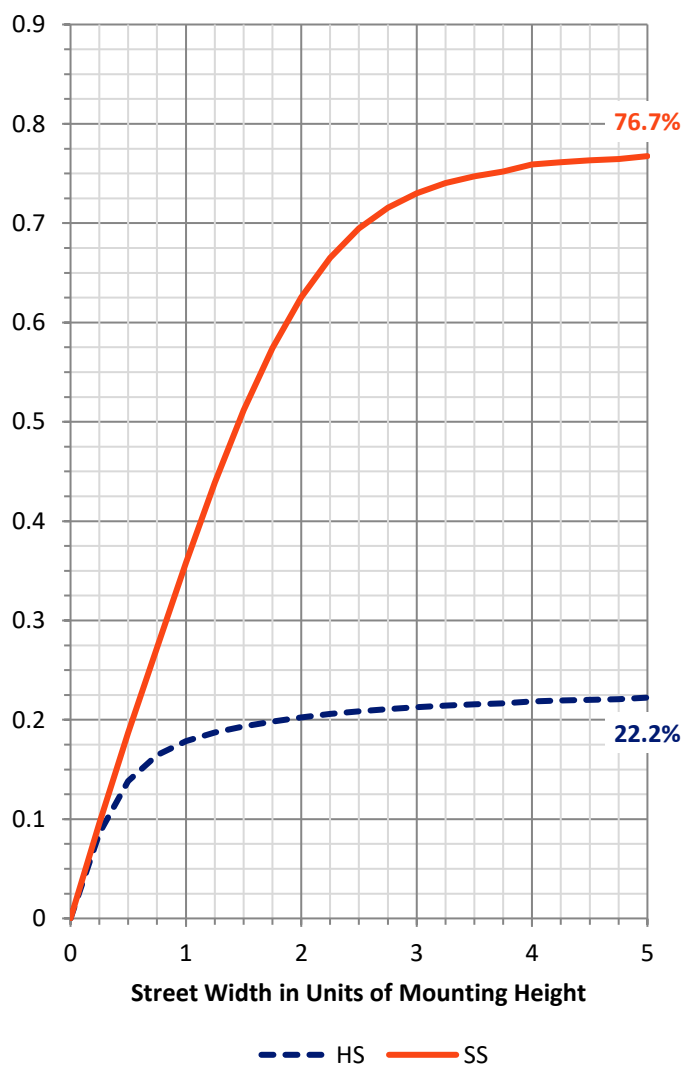
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 1759.1   | 0.0    | 1759.1 |
|                    | % Fixture | 22.9     | 0.0    | 22.9   |
| <b>Street Side</b> | Lumens    | 5915.9   | 0.0    | 5915.9 |
|                    | % Fixture | 77.1     | 0.0    | 77.1   |
| <b>Total</b>       | Lumens    | 7675.0   | 0.0    | 7675.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 79.7   | 1.0       |
| 10°-20°   | 265.6  | 3.5       |
| 20°-30°   | 442.8  | 5.8       |
| 30°-40°   | 628.4  | 8.2       |
| 40°-50°   | 924.3  | 12.0      |
| 50°-60°   | 1565.3 | 20.4      |
| 60°-70°   | 2222.0 | 29.0      |
| 70°-80°   | 1349.9 | 17.6      |
| 80°-90°   | 197.0  | 2.6       |
| 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°    | 7675.0 | 100.0     |
| 0°-180°   | 7675.0 | 100.0     |

**Coefficient of Utilization**



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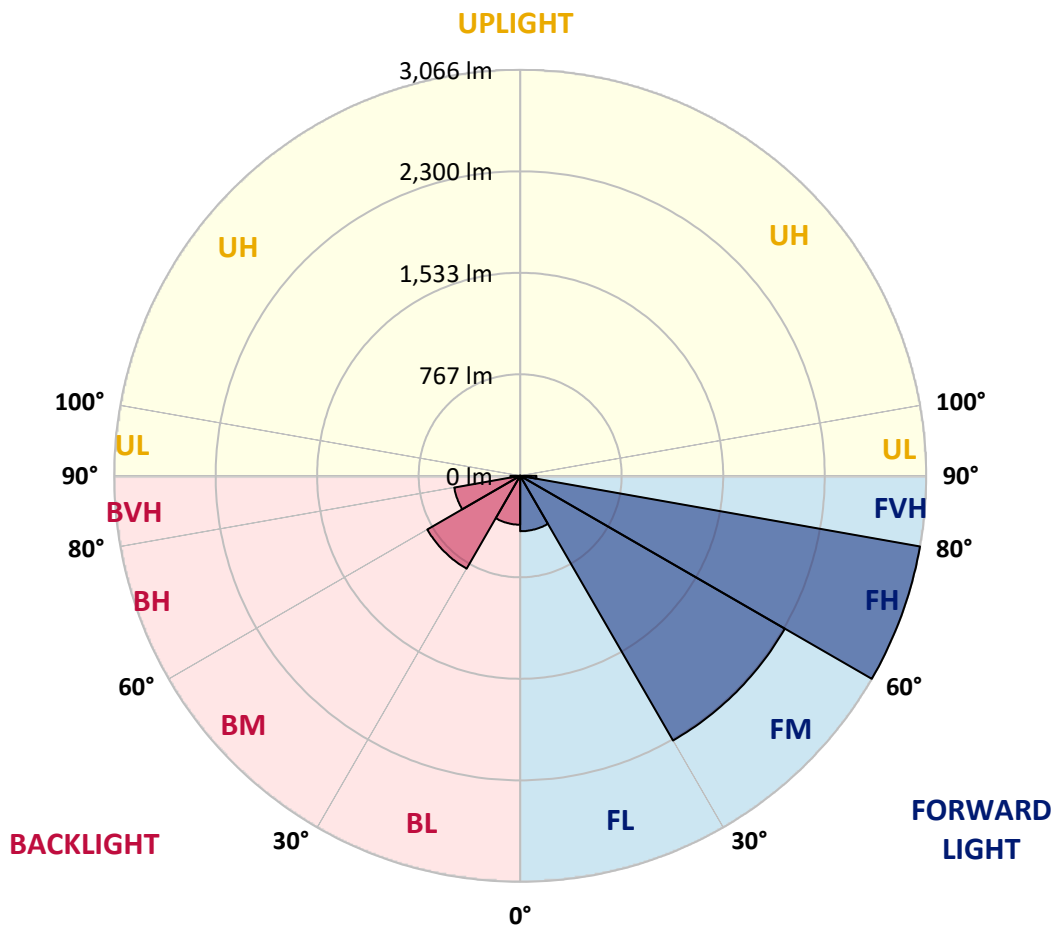
CATALOG NUMBER: GPC-SA2A-830-U-T4W

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

| Zone           | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|----------------|--------|-----------|-------------------------|------|---------|
|                |        |           | B                       | U    | G       |
| FL (0°-30°)    | 418.8  | 5.5       |                         |      |         |
| FM (30°-60°)   | 2308.3 | 30.1      |                         |      |         |
| FH (60°-80°)   | 3066.1 | 39.9      |                         |      | G2/5000 |
| FVH (80°-90°)  | 122.7  | 1.6       |                         |      | G2/225  |
| BL (0°-30°)    | 369.3  | 4.8       | B1/500                  |      |         |
| BM (30°-60°)   | 809.8  | 10.6      | B1/1000                 |      |         |
| BH (60°-80°)   | 505.7  | 6.6       | B2/1000                 |      | G2/1000 |
| BVH (80°-90°)  | 74.3   | 1.0       |                         |      | G1/100  |
| UL (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B2-U0-G2**

Type IV Short





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CATALOG NUMBER: GPC-SA2A-830-U-T4W

**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 46°    | 55°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 781.9  | 781.9  | 781.9  | 781.9  | 781.9  | 781.9  | 781.9  | 781.9  | 781.9  | 781.9  | 781.9  |
| 2.5°  | 821.1  | 821.6  | 822.6  | 820.0  | 812.7  | 810.6  | 809.8  | 802.2  | 797.2  | 789.8  | 783.5  |
| 5°    | 886.7  | 887.3  | 885.7  | 878.3  | 862.0  | 850.0  | 848.9  | 831.6  | 815.8  | 799.0  | 786.4  |
| 7.5°  | 955.3  | 956.1  | 951.1  | 937.2  | 914.3  | 893.3  | 892.0  | 868.3  | 844.4  | 819.0  | 800.1  |
| 10°   | 1016.0 | 1012.8 | 1004.7 | 985.2  | 958.2  | 932.4  | 931.4  | 906.7  | 879.1  | 848.4  | 823.2  |
| 12.5° | 1056.4 | 1053.8 | 1043.3 | 1019.6 | 990.0  | 966.3  | 964.2  | 941.4  | 914.6  | 881.0  | 850.7  |
| 15°   | 1078.7 | 1080.6 | 1066.4 | 1039.6 | 1010.7 | 990.7  | 988.9  | 972.6  | 948.7  | 914.8  | 880.2  |
| 17.5° | 1081.6 | 1083.2 | 1069.5 | 1043.0 | 1019.4 | 1005.7 | 1004.9 | 994.2  | 976.8  | 944.3  | 908.0  |
| 20°   | 1064.8 | 1065.9 | 1054.6 | 1032.8 | 1017.3 | 1013.1 | 1012.8 | 1008.1 | 995.2  | 966.3  | 931.1  |
| 22.5° | 1040.4 | 1041.2 | 1033.0 | 1017.3 | 1012.0 | 1018.6 | 1020.4 | 1018.6 | 1009.4 | 982.3  | 949.2  |
| 25°   | 1034.3 | 1033.8 | 1025.4 | 1009.4 | 1013.9 | 1027.8 | 1030.1 | 1030.9 | 1024.6 | 1001.0 | 972.4  |
| 27.5° | 1063.5 | 1061.7 | 1045.6 | 1019.9 | 1022.8 | 1039.6 | 1042.8 | 1050.4 | 1046.4 | 1025.7 | 998.6  |
| 30°   | 1147.8 | 1144.7 | 1111.8 | 1059.8 | 1045.6 | 1054.3 | 1058.2 | 1070.3 | 1071.1 | 1053.8 | 1033.6 |
| 32.5° | 1290.2 | 1286.2 | 1227.4 | 1134.4 | 1084.3 | 1069.3 | 1073.0 | 1091.1 | 1100.8 | 1087.4 | 1065.6 |
| 35°   | 1470.1 | 1465.6 | 1388.4 | 1261.3 | 1148.9 | 1097.9 | 1100.5 | 1115.0 | 1134.4 | 1115.5 | 1086.6 |
| 37.5° | 1657.6 | 1646.9 | 1572.5 | 1410.5 | 1251.6 | 1159.1 | 1159.1 | 1160.9 | 1170.1 | 1130.7 | 1111.3 |
| 40°   | 1844.1 | 1833.4 | 1766.1 | 1585.9 | 1384.5 | 1255.5 | 1249.5 | 1208.8 | 1201.4 | 1167.5 | 1160.9 |
| 42.5° | 2017.5 | 2014.3 | 1974.7 | 1784.2 | 1540.5 | 1350.3 | 1341.9 | 1272.8 | 1274.4 | 1253.4 | 1253.7 |
| 45°   | 2201.9 | 2201.9 | 2169.6 | 1984.4 | 1722.2 | 1502.7 | 1494.3 | 1392.6 | 1408.4 | 1398.7 | 1422.0 |
| 47.5° | 2352.4 | 2357.1 | 2352.6 | 2192.9 | 1933.7 | 1696.2 | 1681.0 | 1558.6 | 1602.7 | 1636.1 | 1704.1 |
| 50°   | 2506.0 | 2513.4 | 2514.2 | 2421.7 | 2189.3 | 1926.3 | 1909.0 | 1779.0 | 1877.5 | 1973.1 | 2106.8 |
| 52.5° | 2729.0 | 2745.6 | 2679.6 | 2650.0 | 2502.3 | 2199.5 | 2182.4 | 2062.4 | 2226.8 | 2361.0 | 2591.4 |
| 55°   | 2935.7 | 2921.3 | 2874.3 | 2892.7 | 2837.5 | 2510.5 | 2497.6 | 2392.3 | 2616.1 | 2790.5 | 3089.6 |
| 57.5° | 3047.6 | 3046.6 | 3093.8 | 3172.6 | 3198.9 | 2894.0 | 2883.2 | 2780.8 | 3055.0 | 3186.0 | 3557.4 |
| 60°   | 3178.9 | 3180.8 | 3297.9 | 3476.8 | 3585.0 | 3371.5 | 3366.7 | 3289.0 | 3481.3 | 3555.3 | 3924.4 |
| 62.5° | 3197.3 | 3230.4 | 3432.1 | 3740.0 | 3946.4 | 3929.4 | 3939.9 | 3746.8 | 3862.6 | 3850.0 | 4198.3 |
| 65°   | 2985.9 | 3029.5 | 3394.6 | 3819.6 | 4305.7 | 4539.5 | 4549.2 | 4207.3 | 4163.4 | 4101.9 | 4296.3 |
| 67.5° | 2552.5 | 2617.1 | 3013.7 | 3646.5 | 4424.2 | 4990.5 | 5004.2 | 4564.2 | 4412.9 | 4187.3 | 4060.4 |
| 70°   | 1857.5 | 1929.2 | 2328.5 | 3114.3 | 4213.0 | 5134.7 | 5150.2 | 4722.1 | 4422.4 | 3944.3 | 3466.3 |
| 72.5° | 1122.1 | 1178.3 | 1507.4 | 2292.7 | 3555.9 | 4872.0 | 4899.6 | 4521.9 | 4037.6 | 3341.0 | 2559.6 |
| 75°   | 492.7  | 529.5  | 728.9  | 1321.2 | 2545.7 | 4031.0 | 4065.4 | 3870.5 | 3280.6 | 2428.0 | 1512.9 |
| 77.5° | 209.9  | 220.4  | 298.9  | 573.9  | 1439.1 | 2754.5 | 2801.8 | 2828.0 | 2225.8 | 1321.2 | 639.3  |
| 80°   | 130.8  | 135.0  | 169.2  | 259.8  | 673.5  | 1547.1 | 1598.0 | 1663.9 | 1105.3 | 485.7  | 223.3  |
| 82.5° | 79.6   | 84.3   | 112.4  | 157.1  | 350.6  | 701.3  | 725.7  | 772.2  | 428.9  | 209.9  | 115.6  |
| 85°   | 47.8   | 51.2   | 68.8   | 99.3   | 199.6  | 275.8  | 275.5  | 304.7  | 202.0  | 135.0  | 60.9   |
| 87.5° | 22.9   | 25.5   | 36.8   | 51.5   | 100.6  | 103.5  | 96.9   | 109.8  | 122.7  | 88.5   | 30.7   |
| 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: P386517  
 CATALOG NUMBER: GPC-SA2A-830-U-T4W

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|--------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 781.9  | 781.9  | 781.9  | 781.9 | 781.9 | 781.9 | 781.9 | 781.9 | 781.9 | 781.9 | 781.9 |
| 2.5°  | 781.4  | 780.4  | 776.9  | 774.3 | 773.8 | 772.2 | 770.9 | 771.7 | 772.7 | 773.0 | 773.0 |
| 5°    | 781.1  | 778.3  | 773.8  | 772.0 | 774.3 | 777.5 | 781.4 | 786.7 | 789.8 | 792.2 | 793.8 |
| 7.5°  | 793.8  | 788.2  | 783.2  | 782.2 | 786.9 | 795.3 | 804.3 | 815.3 | 822.9 | 828.2 | 829.2 |
| 10°   | 814.8  | 807.9  | 802.9  | 804.0 | 812.4 | 824.5 | 837.1 | 851.3 | 862.8 | 869.9 | 870.4 |
| 12.5° | 838.9  | 832.4  | 827.6  | 832.1 | 846.0 | 860.7 | 873.9 | 886.2 | 896.7 | 903.8 | 903.8 |
| 15°   | 866.8  | 862.0  | 856.5  | 866.8 | 885.7 | 898.8 | 904.3 | 910.4 | 916.2 | 921.4 | 920.4 |
| 17.5° | 893.6  | 889.1  | 886.2  | 898.3 | 918.0 | 924.0 | 920.4 | 915.9 | 915.9 | 918.8 | 919.3 |
| 20°   | 916.7  | 912.7  | 914.6  | 926.4 | 936.6 | 930.3 | 916.7 | 902.5 | 896.7 | 898.3 | 899.9 |
| 22.5° | 936.9  | 935.1  | 940.6  | 946.1 | 938.7 | 916.7 | 891.5 | 872.3 | 865.2 | 864.7 | 865.2 |
| 25°   | 960.5  | 960.3  | 967.1  | 957.1 | 924.6 | 883.8 | 850.0 | 831.3 | 827.4 | 830.5 | 835.8 |
| 27.5° | 990.0  | 992.8  | 996.3  | 959.8 | 895.7 | 834.2 | 799.8 | 786.9 | 790.9 | 798.5 | 803.5 |
| 30°   | 1027.5 | 1035.4 | 1028.0 | 953.2 | 854.2 | 777.5 | 744.6 | 741.0 | 751.7 | 762.5 | 767.7 |
| 32.5° | 1064.0 | 1076.4 | 1058.5 | 936.1 | 800.6 | 717.3 | 691.8 | 690.8 | 703.9 | 714.4 | 721.8 |
| 35°   | 1093.4 | 1117.9 | 1081.4 | 902.2 | 738.6 | 661.9 | 643.2 | 636.2 | 640.9 | 653.2 | 661.6 |
| 37.5° | 1131.8 | 1172.5 | 1097.1 | 850.5 | 671.4 | 616.2 | 594.4 | 578.1 | 573.9 | 578.9 | 583.1 |
| 40°   | 1201.9 | 1255.8 | 1104.5 | 778.3 | 605.7 | 570.5 | 548.4 | 524.5 | 508.0 | 495.9 | 496.2 |
| 42.5° | 1316.4 | 1364.2 | 1099.7 | 690.5 | 545.0 | 525.8 | 500.9 | 473.3 | 446.5 | 419.2 | 417.1 |
| 45°   | 1502.4 | 1525.5 | 1085.6 | 597.5 | 491.7 | 479.1 | 455.7 | 428.1 | 392.4 | 361.4 | 358.5 |
| 47.5° | 1800.0 | 1748.8 | 1063.5 | 516.4 | 444.7 | 439.4 | 417.9 | 386.1 | 348.3 | 323.3 | 321.2 |
| 50°   | 2205.8 | 2071.1 | 1052.7 | 451.8 | 403.2 | 404.8 | 387.2 | 353.5 | 317.8 | 299.4 | 297.3 |
| 52.5° | 2691.2 | 2446.4 | 1073.5 | 401.9 | 369.8 | 375.3 | 362.2 | 330.7 | 300.7 | 286.3 | 284.2 |
| 55°   | 3194.7 | 2835.1 | 1095.8 | 365.6 | 338.3 | 349.1 | 344.6 | 318.6 | 291.6 | 278.2 | 276.3 |
| 57.5° | 3625.7 | 3125.4 | 1051.2 | 336.2 | 310.2 | 327.0 | 330.9 | 311.0 | 286.8 | 274.7 | 272.6 |
| 60°   | 3897.1 | 3242.2 | 934.0  | 308.6 | 287.9 | 309.4 | 323.1 | 308.9 | 288.7 | 287.6 | 286.0 |
| 62.5° | 4025.8 | 3232.0 | 758.3  | 286.8 | 274.0 | 301.8 | 328.8 | 320.7 | 309.7 | 319.1 | 319.9 |
| 65°   | 3968.0 | 3077.6 | 564.7  | 272.4 | 264.0 | 304.7 | 346.2 | 343.0 | 315.7 | 325.2 | 326.5 |
| 67.5° | 3587.6 | 2709.1 | 418.2  | 259.8 | 252.9 | 312.8 | 377.7 | 350.4 | 303.9 | 310.7 | 306.5 |
| 70°   | 2899.7 | 2147.8 | 322.5  | 245.6 | 241.6 | 311.8 | 391.9 | 345.9 | 291.0 | 292.6 | 281.3 |
| 72.5° | 1999.6 | 1464.6 | 262.4  | 232.5 | 225.4 | 284.2 | 381.9 | 334.9 | 280.3 | 268.2 | 253.2 |
| 75°   | 1087.4 | 786.1  | 223.0  | 218.8 | 196.7 | 249.5 | 363.5 | 327.0 | 270.5 | 254.5 | 246.1 |
| 77.5° | 427.9  | 326.2  | 193.6  | 200.1 | 172.0 | 220.4 | 343.0 | 312.0 | 257.1 | 236.1 | 231.9 |
| 80°   | 174.7  | 166.5  | 160.5  | 173.1 | 147.9 | 192.8 | 318.3 | 294.4 | 241.1 | 219.1 | 210.7 |
| 82.5° | 99.0   | 103.5  | 124.8  | 136.6 | 120.0 | 177.6 | 306.5 | 280.3 | 221.9 | 196.2 | 186.2 |
| 85°   | 50.7   | 60.7   | 86.9   | 98.0  | 88.3  | 151.0 | 282.4 | 245.3 | 178.1 | 150.2 | 151.0 |
| 87.5° | 24.4   | 33.9   | 54.9   | 61.5  | 57.3  | 109.3 | 210.9 | 177.8 | 138.7 | 109.8 | 106.4 |
| 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                      |                   |                             |                         |

REPORT NUMBER: SP1-2408-195-9

**Scotopic Flux vs. Wavelength**



**Scotopic Lumens: NR**

**S/P: 1.27**

| 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            |        |                          |               |

REPORT NUMBER: SP1-2408-195-9

**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)