

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: P1435467

Luminaire Tested: **GALN-SB2A-835-U-T4LG**

Issue Date: 03/24/202

This test was performed under the Supervised Manufacturer's Testing Program. The results of this test have not been influenced by sources from within Cooper Lighting Solutions or from external interests.

Report Generated By 670245763



**Test Information**

Test Method: LM-79-08  
 Report Number: P1435467  
 Test Lab: INNOVATION CENTER(G1)  
 Issue Date: 03/24/202  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: McGRAW-EDISON  
 Catalog Number: GALN-SB2A-835-U-T4LG  
 Description: GALLEON II AREA AND ROADWAY HIGH DENSITY LUMINAIRE 350mA 2xLight Square PACKAGE 80CRI 3500K FIXTURE w/ TYPE IV LOW GLARE  
 Light Source: (52) 3500K CCT, 80 CRI LEDS  
 Ballast/Driver: ELECTRONIC DRIVER

Luminaire Equipment:

| <u>Sample No.</u> | <u>Condition</u> | <u>Description</u> |
|-------------------|------------------|--------------------|
| a                 | good             | reflector          |
| b                 | good             | lens               |
| c                 | good             | housing            |
| d                 | good             | cord               |

**Summary**

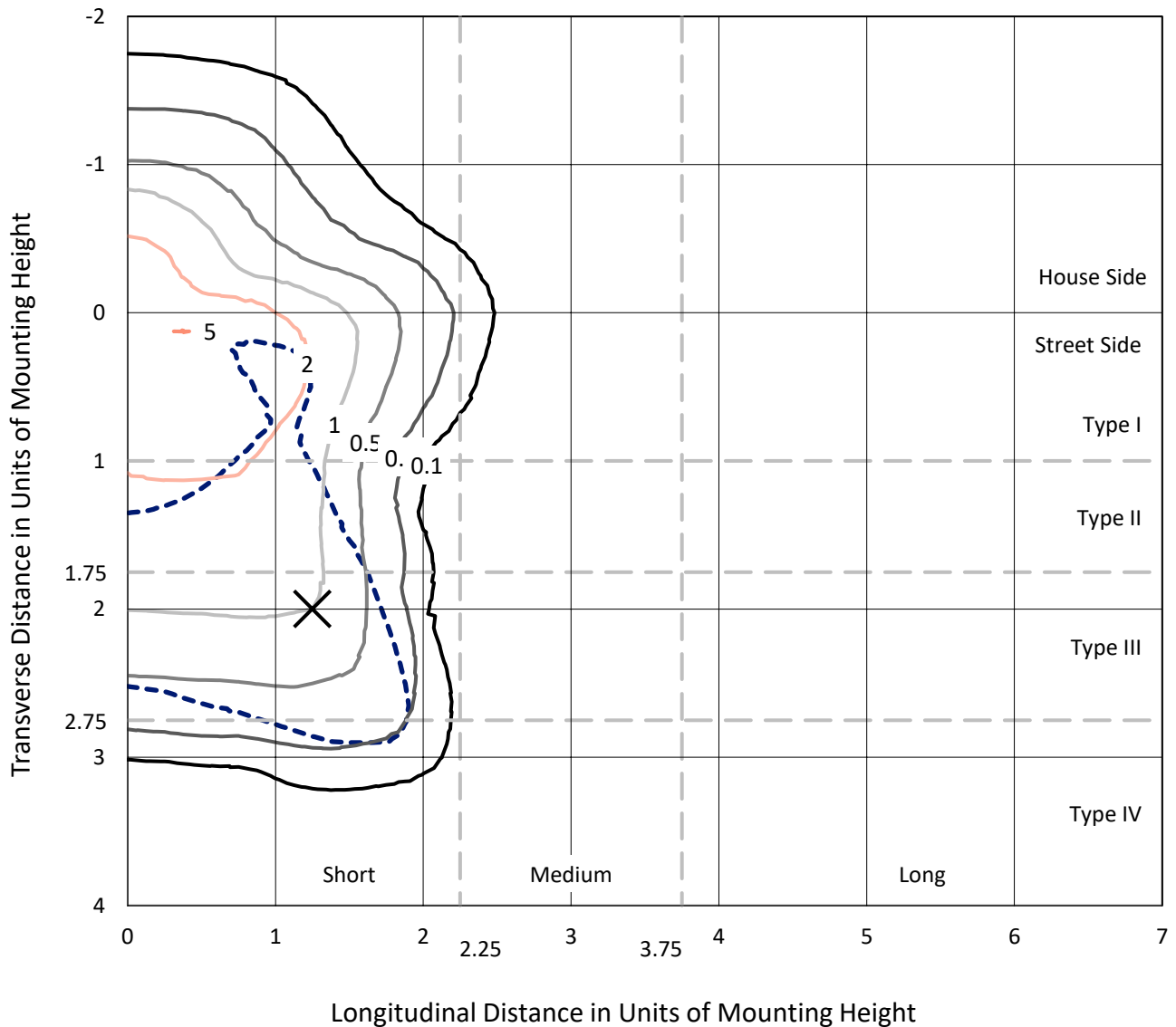
Lumens per Lamp: N/A  
 Luminaire Lumens: 8145.8 lumens  
 Efficiency: N/A  
 Efficacy: 142.2 lumens/watt  
 Luminous Opening: Rectangular (W 1' x L: 1' x H: 0')  
 IES Classification: Type IV - Short  
 BUG Rating: B2 - U0 - G2

Input Watts (W): 57.3  
 Input Voltage (V): 120  
 Input Current (Ain): NR  
 Voltage Rise (V): NR  
 Power Factor: 0.97  
 Total Harmonic Distortion (THDi): NR  
 Frequency (hertz): 60  
 Stabilization Time: NR  
 Operation Time: NR  
 Ambient Temperature (°C): NR  
 Test Distance: 28.75 FT

REPORT NUMBER: P1435467  
 CATALOG NUMBER: GALN-SB2A-835-U-T4LG

### Iso-Footcandle Lines of Horizontal Illumination

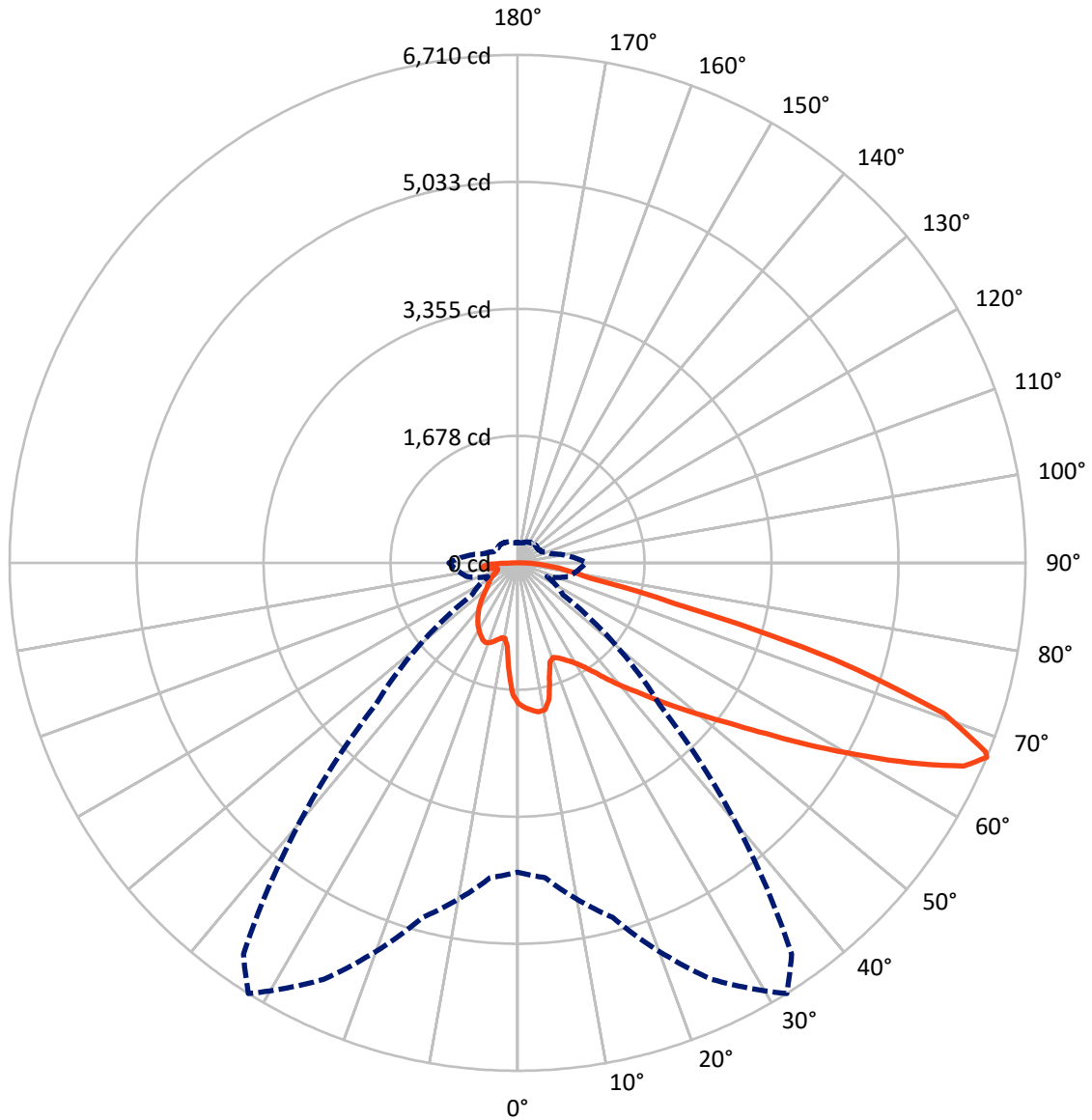
✕ Max cd  
 - - - 1/2 Max cd



Based on 20 foot mounting height. Maximum calculated value = 5 fc  
 Type IV - Short - N/A

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### Luminous Intensity Polar Plot



— Vertical Plane Through 32-Deg Lateral    - - - Horizontal Cone Through 67-Deg Vertical

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**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 1928.5   | 0.0    | 1928.5 |
|                    | % Fixture | 23.7     | 0.0    | 23.7   |
| <b>Street Side</b> | Lumens    | 6217.3   | 0.0    | 6217.3 |
|                    | % Fixture | 76.3     | 0.0    | 76.3   |
| <b>Total</b>       | Lumens    | 8145.8   | 0.0    | 8145.8 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**Coefficient of Utilization**

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 162.6  | 2.0       |
| 10°-20°   | 431.8  | 5.3       |
| 20°-30°   | 705.1  | 8.7       |
| 30°-40°   | 1039.3 | 12.8      |
| 40°-50°   | 1433.2 | 17.6      |
| 50°-60°   | 1810.5 | 22.2      |
| 60°-70°   | 1752.3 | 21.5      |
| 70°-80°   | 625.4  | 7.7       |
| 80°-90°   | 185.7  | 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°    | 8145.8 | 100.0     |
| 0°-180°   | 8145.8 | 100.0     |

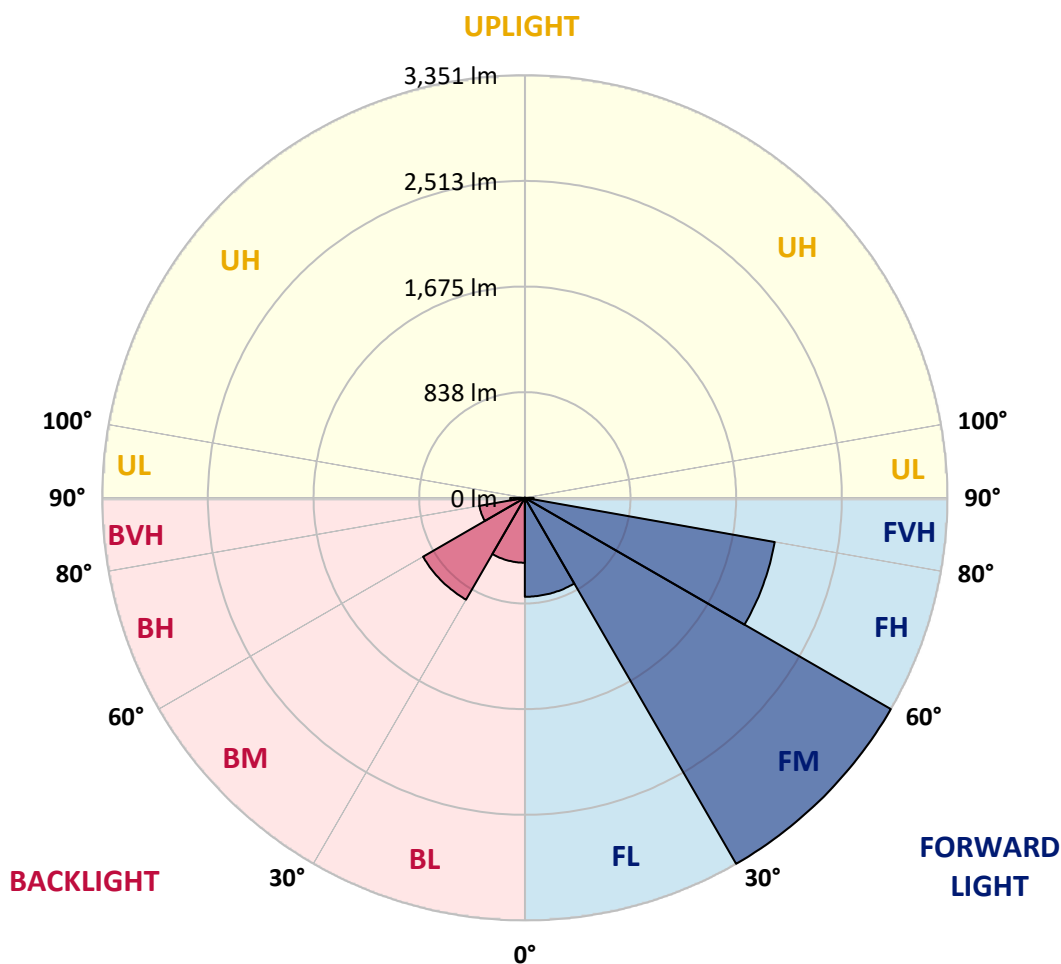


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**LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:**

| Zone           | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|----------------|--------|-----------|-------------------------|------|---------|
|                |        |           | B                       | U    | G       |
| FL (0°-30°)    | 784.9  | 9.6       |                         |      |         |
| FM (30°-60°)   | 3350.6 | 41.1      |                         |      |         |
| FH (60°-80°)   | 2011.8 | 24.7      |                         |      | G2/5000 |
| FVH (80°-90°)  | 70.0   | 0.9       |                         |      | G1/100  |
| BL (0°-30°)    | 514.6  | 6.3       | B2/1000                 |      |         |
| BM (30°-60°)   | 932.3  | 11.4      | B1/1000                 |      |         |
| BH (60°-80°)   | 365.8  | 4.5       | B1/500                  |      | G1/500  |
| BVH (80°-90°)  | 115.7  | 1.4       |                         |      | G2/225  |
| 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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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 32°    | 35°    | 45°    | 55°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1861.2 | 1861.2 | 1861.2 | 1861.2 | 1861.2 | 1861.2 | 1861.2 | 1861.2 | 1861.2 | 1861.2 | 1861.2 |
| 2.5°  | 1931.7 | 1926.3 | 1920.8 | 1924.5 | 1917.2 | 1915.4 | 1906.4 | 1902.8 | 1891.9 | 1890.1 | 1870.2 |
| 5°    | 1971.5 | 1960.6 | 1958.8 | 1962.4 | 1955.2 | 1955.2 | 1948.0 | 1942.6 | 1926.3 | 1917.2 | 1888.3 |
| 7.5°  | 1971.5 | 1969.7 | 1973.3 | 1986.0 | 1987.8 | 1987.8 | 1987.8 | 1989.6 | 1973.3 | 1960.6 | 1915.4 |
| 10°   | 1859.4 | 1841.3 | 1881.1 | 1944.4 | 1975.1 | 1993.2 | 2025.8 | 2045.6 | 2033.0 | 2023.9 | 1962.4 |
| 12.5° | 1524.7 | 1526.5 | 1589.9 | 1725.5 | 1848.5 | 1901.0 | 2036.6 | 2109.0 | 2114.4 | 2099.9 | 2022.1 |
| 15°   | 1293.2 | 1302.3 | 1334.8 | 1432.5 | 1573.6 | 1651.3 | 1973.3 | 2165.0 | 2208.4 | 2194.0 | 2094.5 |
| 17.5° | 1222.7 | 1228.1 | 1242.6 | 1298.7 | 1378.2 | 1441.5 | 1801.5 | 2201.2 | 2322.4 | 2304.3 | 2175.9 |
| 20°   | 1211.8 | 1215.5 | 1233.5 | 1280.6 | 1334.8 | 1371.0 | 1626.0 | 2172.3 | 2429.1 | 2421.9 | 2250.0 |
| 22.5° | 1213.6 | 1217.3 | 1240.8 | 1305.9 | 1362.0 | 1392.7 | 1570.0 | 2105.3 | 2541.2 | 2548.5 | 2326.0 |
| 25°   | 1217.3 | 1219.1 | 1255.2 | 1342.1 | 1412.6 | 1450.6 | 1606.1 | 2045.6 | 2635.3 | 2696.8 | 2409.2 |
| 27.5° | 1237.2 | 1242.6 | 1291.4 | 1389.1 | 1472.3 | 1515.7 | 1691.1 | 2065.5 | 2738.4 | 2865.0 | 2508.7 |
| 30°   | 1291.4 | 1295.0 | 1354.7 | 1456.0 | 1546.4 | 1591.7 | 1792.4 | 2145.1 | 2865.0 | 3038.6 | 2606.3 |
| 32.5° | 1376.4 | 1380.0 | 1448.8 | 1553.7 | 1651.3 | 1705.6 | 1924.5 | 2297.1 | 3006.1 | 3221.3 | 2704.0 |
| 35°   | 1494.0 | 1495.8 | 1573.6 | 1685.7 | 1788.8 | 1850.3 | 2078.2 | 2468.9 | 3152.6 | 3376.9 | 2776.4 |
| 37.5° | 1633.3 | 1645.9 | 1725.5 | 1843.1 | 1964.3 | 2020.3 | 2259.1 | 2669.7 | 3282.8 | 3508.9 | 2818.0 |
| 40°   | 1825.0 | 1828.6 | 1906.4 | 2020.3 | 2148.7 | 2203.0 | 2439.9 | 2859.6 | 3425.7 | 3586.7 | 2855.9 |
| 42.5° | 2022.1 | 2052.9 | 2118.0 | 2244.6 | 2340.5 | 2383.9 | 2646.1 | 3033.2 | 3539.6 | 3590.3 | 2839.7 |
| 45°   | 2286.2 | 2309.7 | 2374.8 | 2487.0 | 2582.8 | 2633.5 | 2868.6 | 3192.4 | 3597.5 | 3559.5 | 2803.5 |
| 47.5° | 2588.3 | 2602.7 | 2655.2 | 2756.5 | 2863.2 | 2899.4 | 3100.1 | 3282.8 | 3619.2 | 3537.8 | 2787.2 |
| 50°   | 2944.6 | 2944.6 | 2982.6 | 3069.4 | 3167.0 | 3217.7 | 3313.6 | 3337.1 | 3682.5 | 3499.8 | 2828.8 |
| 52.5° | 3244.8 | 3259.3 | 3309.9 | 3432.9 | 3530.6 | 3588.5 | 3480.0 | 3420.3 | 3554.1 | 3288.2 | 2841.5 |
| 55°   | 3532.4 | 3548.7 | 3662.6 | 3816.4 | 3982.8 | 4046.1 | 3688.0 | 3378.7 | 3121.8 | 2978.9 | 2754.7 |
| 57.5° | 3807.3 | 3841.7 | 3984.6 | 4284.8 | 4536.2 | 4530.8 | 3952.0 | 3006.1 | 2548.5 | 2637.1 | 2564.7 |
| 60°   | 4190.8 | 4226.9 | 4454.8 | 4832.9 | 5140.3 | 5011.9 | 3955.6 | 2501.4 | 1986.0 | 2105.3 | 2208.4 |
| 62.5° | 4510.9 | 4572.4 | 4907.0 | 5536.5 | 5818.6 | 5617.8 | 3628.3 | 1915.4 | 1318.5 | 1468.7 | 1707.4 |
| 65°   | 4482.0 | 4563.4 | 5082.5 | 6053.7 | 6475.2 | 6288.9 | 3149.0 | 1211.8 | 680.1  | 1003.8 | 1195.6 |
| 67°   | 4087.7 | 4176.3 | 4849.1 | 6071.8 | 6710.3 | 6312.4 | 2658.8 | 732.5  | 432.3  | 696.4  | 830.2  |
| 67.5° | 3861.6 | 3991.8 | 4733.4 | 6037.5 | 6666.9 | 6212.9 | 2438.1 | 613.2  | 407.0  | 647.5  | 756.0  |
| 70°   | 2374.8 | 2584.6 | 3552.3 | 5337.5 | 5976.0 | 5200.0 | 1354.7 | 347.3  | 331.0  | 434.1  | 522.7  |
| 72.5° | 714.4  | 777.7  | 1371.0 | 3423.9 | 4386.1 | 3854.4 | 609.5  | 267.7  | 296.6  | 349.1  | 403.3  |
| 75°   | 347.3  | 370.8  | 566.1  | 1399.9 | 2136.1 | 2125.2 | 340.0  | 229.7  | 274.9  | 293.0  | 318.3  |
| 77.5° | 222.5  | 236.9  | 352.7  | 783.2  | 978.5  | 871.8  | 246.0  | 200.8  | 244.2  | 240.6  | 236.9  |
| 80°   | 139.3  | 146.5  | 226.1  | 454.0  | 721.7  | 602.3  | 180.9  | 164.6  | 209.8  | 186.3  | 168.2  |
| 82.5° | 90.4   | 99.5   | 144.7  | 276.7  | 515.5  | 448.6  | 119.4  | 117.6  | 173.6  | 148.3  | 130.2  |
| 85°   | 59.7   | 66.9   | 92.2   | 162.8  | 305.7  | 320.1  | 77.8   | 81.4   | 133.8  | 112.1  | 99.5   |
| 87.5° | 21.7   | 27.1   | 47.0   | 72.3   | 142.9  | 177.3  | 32.6   | 30.7   | 65.1   | 52.5   | 41.6   |
| 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: P1435467

CATALOG NUMBER: GALN-SB2A-835-U-T4LG

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1861.2 | 1861.2 | 1861.2 | 1861.2 | 1861.2 | 1861.2 | 1861.2 | 1861.2 | 1861.2 | 1861.2 | 1861.2 |
| 2.5°  | 1866.6 | 1861.2 | 1835.8 | 1814.1 | 1797.9 | 1776.2 | 1752.6 | 1725.5 | 1707.4 | 1711.0 | 1705.6 |
| 5°    | 1875.6 | 1861.2 | 1812.3 | 1738.2 | 1665.8 | 1575.4 | 1459.6 | 1390.9 | 1338.4 | 1311.3 | 1318.5 |
| 7.5°  | 1895.5 | 1870.2 | 1767.1 | 1617.0 | 1428.9 | 1244.4 | 1130.4 | 1065.3 | 1034.6 | 1021.9 | 1020.1 |
| 10°   | 1929.9 | 1886.5 | 1709.2 | 1428.9 | 1182.9 | 1058.1 | 1016.5 | 998.4  | 994.8  | 994.8  | 993.0  |
| 12.5° | 1971.5 | 1902.8 | 1611.6 | 1246.2 | 1065.3 | 1020.1 | 1012.9 | 1014.7 | 1020.1 | 1025.5 | 1016.5 |
| 15°   | 2022.1 | 1910.0 | 1490.4 | 1135.9 | 1041.8 | 1031.0 | 1041.8 | 1054.5 | 1063.5 | 1070.8 | 1061.7 |
| 17.5° | 2072.8 | 1902.8 | 1376.4 | 1083.4 | 1045.4 | 1059.9 | 1081.6 | 1101.5 | 1106.9 | 1117.8 | 1110.5 |
| 20°   | 2109.0 | 1877.4 | 1278.8 | 1063.5 | 1054.5 | 1087.0 | 1114.2 | 1135.9 | 1146.7 | 1154.0 | 1146.7 |
| 22.5° | 2136.1 | 1844.9 | 1208.2 | 1043.6 | 1054.5 | 1094.3 | 1126.8 | 1152.1 | 1164.8 | 1172.0 | 1163.0 |
| 25°   | 2159.6 | 1799.7 | 1154.0 | 1014.7 | 1032.8 | 1070.8 | 1106.9 | 1132.3 | 1150.3 | 1161.2 | 1155.8 |
| 27.5° | 2188.5 | 1763.5 | 1103.3 | 971.3  | 987.6  | 1023.7 | 1061.7 | 1092.5 | 1126.8 | 1144.9 | 1141.3 |
| 30°   | 2221.1 | 1745.4 | 1054.5 | 924.2  | 935.1  | 971.3  | 1016.5 | 1058.1 | 1105.1 | 1128.6 | 1128.6 |
| 32.5° | 2259.1 | 1732.7 | 1009.3 | 879.0  | 888.1  | 927.9  | 971.3  | 1009.3 | 1059.9 | 1097.9 | 1096.1 |
| 35°   | 2275.4 | 1718.3 | 973.1  | 837.4  | 855.5  | 888.1  | 922.4  | 947.8  | 1000.2 | 1045.4 | 1049.1 |
| 37.5° | 2291.6 | 1712.8 | 955.0  | 804.9  | 819.3  | 844.7  | 862.8  | 875.4  | 924.2  | 971.3  | 973.1  |
| 40°   | 2311.5 | 1738.2 | 967.7  | 783.2  | 770.5  | 795.8  | 804.9  | 812.1  | 837.4  | 868.2  | 868.2  |
| 42.5° | 2298.9 | 1756.3 | 996.6  | 763.3  | 710.8  | 739.8  | 743.4  | 741.6  | 743.4  | 745.2  | 743.4  |
| 45°   | 2266.3 | 1738.2 | 996.6  | 732.5  | 647.5  | 678.3  | 676.5  | 667.4  | 652.9  | 615.0  | 609.5  |
| 47.5° | 2259.1 | 1727.3 | 958.6  | 681.9  | 584.2  | 609.5  | 613.2  | 595.1  | 553.5  | 513.7  | 501.0  |
| 50°   | 2289.8 | 1747.2 | 898.9  | 620.4  | 530.0  | 551.7  | 560.7  | 530.0  | 482.9  | 441.3  | 434.1  |
| 52.5° | 2335.0 | 1772.5 | 812.1  | 553.5  | 484.7  | 506.4  | 517.3  | 482.9  | 434.1  | 401.5  | 397.9  |
| 55°   | 2329.6 | 1772.5 | 714.4  | 492.0  | 450.4  | 466.6  | 484.7  | 448.6  | 410.6  | 392.5  | 390.7  |
| 57.5° | 2212.0 | 1705.6 | 642.1  | 448.6  | 417.8  | 432.3  | 455.8  | 421.4  | 385.3  | 388.9  | 394.3  |
| 60°   | 1982.3 | 1532.0 | 587.8  | 419.6  | 388.9  | 403.3  | 428.7  | 388.9  | 341.8  | 329.2  | 329.2  |
| 62.5° | 1633.3 | 1262.5 | 544.4  | 390.7  | 361.7  | 379.8  | 392.5  | 340.0  | 309.3  | 294.8  | 294.8  |
| 65°   | 1224.5 | 976.7  | 499.2  | 367.2  | 338.2  | 358.1  | 343.7  | 318.3  | 287.6  | 276.7  | 278.5  |
| 67°   | 908.0  | 757.8  | 461.2  | 347.3  | 323.8  | 332.8  | 321.9  | 303.9  | 273.1  | 264.1  | 273.1  |
| 67.5° | 815.7  | 719.9  | 452.2  | 341.8  | 320.1  | 327.4  | 316.5  | 302.1  | 269.5  | 260.5  | 269.5  |
| 70°   | 560.7  | 553.5  | 403.3  | 316.5  | 300.2  | 293.0  | 298.4  | 280.3  | 253.2  | 249.6  | 258.6  |
| 72.5° | 426.9  | 441.3  | 361.7  | 294.8  | 278.5  | 269.5  | 282.2  | 264.1  | 236.9  | 242.4  | 251.4  |
| 75°   | 334.6  | 356.3  | 323.8  | 264.1  | 253.2  | 255.0  | 280.3  | 273.1  | 251.4  | 256.8  | 258.6  |
| 77.5° | 247.8  | 287.6  | 276.7  | 229.7  | 220.7  | 246.0  | 316.5  | 338.2  | 300.2  | 291.2  | 278.5  |
| 80°   | 180.9  | 206.2  | 233.3  | 189.9  | 184.5  | 236.9  | 390.7  | 432.3  | 370.8  | 334.6  | 325.6  |
| 82.5° | 133.8  | 144.7  | 191.7  | 151.9  | 133.8  | 211.6  | 434.1  | 508.2  | 441.3  | 372.6  | 361.7  |
| 85°   | 95.9   | 112.1  | 151.9  | 112.1  | 88.6   | 173.6  | 425.0  | 497.4  | 437.7  | 352.7  | 343.7  |
| 87.5° | 34.4   | 48.8   | 65.1   | 50.6   | 45.2   | 119.4  | 350.9  | 358.1  | 273.1  | 124.8  | 126.6  |
| 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: SP1-2407-184-10

Test Date: 10/11/2024

Luminaire Tested: GSS-SB1A-835-U-5WQ

Data in this report applies to families of products including GSS-SB1A-835-U-5WQ

**Test Information**

Test Method: LM-79-2019  
 Report Number: SP1-2407-184-10  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry: 4π  
 Issue Date: 10/15/2024  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: McGraw-Edison  
 Catalog Number: **GSS-SB1A-835-U-5WQ**  
 Description: GALLEON II SITE SLIM 1SQ 350MA 5WQ HIGH DENSITY LIGHTSQUARE WITH 80 CRI 3500K CCT 26 LEDS

**Spectral Parameters**

CCT (K): 3411  
 CIE u': 0.2360  
 CIE v': 0.5189  
 Duv: 0.0044  
 CIE x: 0.4154  
 CIE y: 0.4059  
 CIE z: 0.1787  
 Peak Wavelength (nm): 601  
 Dominant Wavelength (nm): 579  
 Purity: 46.51914  
 Rf: 86.6  
 Rg: 95.9

|           |      |      |      |
|-----------|------|------|------|
| CRI (Ra): | 83.5 |      |      |
| R1:       | 81.1 | R9:  | 6.3  |
| R2:       | 88.9 | R10: | 75.4 |
| R3:       | 97.2 | R11: | 84.1 |
| R4:       | 83.8 | R12: | 69.7 |
| R5:       | 81.7 | R13: | 82.8 |
| R6:       | 86.9 | R14: | 98.5 |
| R7:       | 86.1 | R15: | 72.6 |
| R8:       | 62.2 |      |      |



**Test Conditions**

Stabilization Time: 35M  
 Operation Time: 1H 35M  
 Sphere Temperature (°C): 25.2

REPORT NUMBER: SP1-2407-184-10

| 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 3500K 7-step quadrangle

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**Photopic Flux vs. Wavelength**



**Photopic Lumens: NR**

| 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    | 311                      | NR            | 620    | 903                      | NR            | 750    | 26                       | NR            | 880    | 1                        | NR            |
| 365    | 0                        | NR            | 495    | 376                      | NR            | 625    | 851                      | NR            | 755    | 22                       | NR            | 885    | 1                        | NR            |
| 370    | 0                        | NR            | 500    | 438                      | NR            | 630    | 797                      | NR            | 760    | 19                       | NR            | 890    | 0                        | NR            |
| 375    | 0                        | NR            | 505    | 491                      | NR            | 635    | 735                      | NR            | 765    | 16                       | NR            | 895    | 0                        | NR            |
| 380    | 0                        | NR            | 510    | 533                      | NR            | 640    | 672                      | NR            | 770    | 14                       | NR            | 900    | 0                        | NR            |
| 385    | 0                        | NR            | 515    | 566                      | NR            | 645    | 607                      | NR            | 775    | 12                       | NR            | 905    | 0                        | NR            |
| 390    | 0                        | NR            | 520    | 592                      | NR            | 650    | 546                      | NR            | 780    | 10                       | NR            | 910    | 0                        | NR            |
| 395    | 1                        | NR            | 525    | 608                      | NR            | 655    | 487                      | NR            | 785    | 9                        | NR            | 915    | 0                        | NR            |
| 400    | 3                        | NR            | 530    | 625                      | NR            | 660    | 429                      | NR            | 790    | 7                        | NR            | 920    | 0                        | NR            |
| 405    | 6                        | NR            | 535    | 642                      | NR            | 665    | 378                      | NR            | 795    | 6                        | NR            | 925    | 0                        | NR            |
| 410    | 12                       | NR            | 540    | 657                      | NR            | 670    | 329                      | NR            | 800    | 5                        | NR            | 930    | 0                        | NR            |
| 415    | 22                       | NR            | 545    | 677                      | NR            | 675    | 286                      | NR            | 805    | 5                        | NR            | 935    | 0                        | NR            |
| 420    | 43                       | NR            | 550    | 701                      | NR            | 680    | 248                      | NR            | 810    | 4                        | NR            | 940    | 0                        | NR            |
| 425    | 80                       | NR            | 555    | 728                      | NR            | 685    | 213                      | NR            | 815    | 3                        | NR            | 945    | 0                        | NR            |
| 430    | 140                      | NR            | 560    | 757                      | NR            | 690    | 184                      | NR            | 820    | 3                        | NR            | 950    | 0                        | NR            |
| 435    | 243                      | NR            | 565    | 793                      | NR            | 695    | 156                      | NR            | 825    | 3                        | NR            | 955    | 0                        | NR            |
| 440    | 412                      | NR            | 570    | 831                      | NR            | 700    | 134                      | NR            | 830    | 2                        | NR            | 960    | 0                        | NR            |
| 445    | 610                      | NR            | 575    | 872                      | NR            | 705    | 114                      | NR            | 835    | 2                        | NR            | 965    | 0                        | NR            |
| 450    | 597                      | NR            | 580    | 911                      | NR            | 710    | 97                       | NR            | 840    | 2                        | NR            | 970    | 0                        | NR            |
| 455    | 412                      | NR            | 585    | 944                      | NR            | 715    | 83                       | NR            | 845    | 1                        | NR            | 975    | 0                        | NR            |
| 460    | 330                      | NR            | 590    | 974                      | NR            | 720    | 70                       | NR            | 850    | 1                        | NR            | 980    | 0                        | NR            |
| 465    | 274                      | NR            | 595    | 992                      | NR            | 725    | 60                       | NR            | 855    | 1                        | NR            | 985    | 0                        | NR            |
| 470    | 211                      | NR            | 600    | 999                      | NR            | 730    | 51                       | NR            | 860    | 1                        | NR            | 990    | 0                        | NR            |
| 475    | 200                      | NR            | 605    | 992                      | NR            | 735    | 43                       | NR            | 865    | 1                        | NR            | 995    | 0                        | NR            |
| 480    | 220                      | NR            | 610    | 975                      | NR            | 740    | 36                       | NR            | 870    | 1                        | NR            | 1000   | 0                        | NR            |
| 485    | 255                      | NR            | 615    | 944                      | NR            | 745    | 31                       | NR            | 875    | 1                        | NR            |        |                          |               |

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**Scotopic Flux vs. Wavelength**



**Scotopic Lumens: NR**

**S/P: 1.48**

| 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    | 311                      | NR            | 620    | 903                      | NR            | 750    | 26                       | NR            | 880    | 1                        | NR            |
| 365    | 0                        | NR            | 495    | 376                      | NR            | 625    | 851                      | NR            | 755    | 22                       | NR            | 885    | 1                        | NR            |
| 370    | 0                        | NR            | 500    | 438                      | NR            | 630    | 797                      | NR            | 760    | 19                       | NR            | 890    | 0                        | NR            |
| 375    | 0                        | NR            | 505    | 491                      | NR            | 635    | 735                      | NR            | 765    | 16                       | NR            | 895    | 0                        | NR            |
| 380    | 0                        | NR            | 510    | 533                      | NR            | 640    | 672                      | NR            | 770    | 14                       | NR            | 900    | 0                        | NR            |
| 385    | 0                        | NR            | 515    | 566                      | NR            | 645    | 607                      | NR            | 775    | 12                       | NR            | 905    | 0                        | NR            |
| 390    | 0                        | NR            | 520    | 592                      | NR            | 650    | 546                      | NR            | 780    | 10                       | NR            | 910    | 0                        | NR            |
| 395    | 1                        | NR            | 525    | 608                      | NR            | 655    | 487                      | NR            | 785    | 9                        | NR            | 915    | 0                        | NR            |
| 400    | 3                        | NR            | 530    | 625                      | NR            | 660    | 429                      | NR            | 790    | 7                        | NR            | 920    | 0                        | NR            |
| 405    | 6                        | NR            | 535    | 642                      | NR            | 665    | 378                      | NR            | 795    | 6                        | NR            | 925    | 0                        | NR            |
| 410    | 12                       | NR            | 540    | 657                      | NR            | 670    | 329                      | NR            | 800    | 5                        | NR            | 930    | 0                        | NR            |
| 415    | 22                       | NR            | 545    | 677                      | NR            | 675    | 286                      | NR            | 805    | 5                        | NR            | 935    | 0                        | NR            |
| 420    | 43                       | NR            | 550    | 701                      | NR            | 680    | 248                      | NR            | 810    | 4                        | NR            | 940    | 0                        | NR            |
| 425    | 80                       | NR            | 555    | 728                      | NR            | 685    | 213                      | NR            | 815    | 3                        | NR            | 945    | 0                        | NR            |
| 430    | 140                      | NR            | 560    | 757                      | NR            | 690    | 184                      | NR            | 820    | 3                        | NR            | 950    | 0                        | NR            |
| 435    | 243                      | NR            | 565    | 793                      | NR            | 695    | 156                      | NR            | 825    | 3                        | NR            | 955    | 0                        | NR            |
| 440    | 412                      | NR            | 570    | 831                      | NR            | 700    | 134                      | NR            | 830    | 2                        | NR            | 960    | 0                        | NR            |
| 445    | 610                      | NR            | 575    | 872                      | NR            | 705    | 114                      | NR            | 835    | 2                        | NR            | 965    | 0                        | NR            |
| 450    | 597                      | NR            | 580    | 911                      | NR            | 710    | 97                       | NR            | 840    | 2                        | NR            | 970    | 0                        | NR            |
| 455    | 412                      | NR            | 585    | 944                      | NR            | 715    | 83                       | NR            | 845    | 1                        | NR            | 975    | 0                        | NR            |
| 460    | 330                      | NR            | 590    | 974                      | NR            | 720    | 70                       | NR            | 850    | 1                        | NR            | 980    | 0                        | NR            |
| 465    | 274                      | NR            | 595    | 992                      | NR            | 725    | 60                       | NR            | 855    | 1                        | NR            | 985    | 0                        | NR            |
| 470    | 211                      | NR            | 600    | 999                      | NR            | 730    | 51                       | NR            | 860    | 1                        | NR            | 990    | 0                        | NR            |
| 475    | 200                      | NR            | 605    | 992                      | NR            | 735    | 43                       | NR            | 865    | 1                        | NR            | 995    | 0                        | NR            |
| 480    | 220                      | NR            | 610    | 975                      | NR            | 740    | 36                       | NR            | 870    | 1                        | NR            | 1000   | 0                        | NR            |
| 485    | 255                      | NR            | 615    | 944                      | NR            | 745    | 31                       | NR            | 875    | 1                        | NR            |        |                          |               |

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Melanopic Flux vs. Wavelength



Melanopic Lumens: NR

M/P: 2.88

| 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    | 311                      | NR            | 620    | 903                      | NR            | 750    | 26                       | NR            | 880    | 1                        | NR            |
| 365    | 0                        | NR            | 495    | 376                      | NR            | 625    | 851                      | NR            | 755    | 22                       | NR            | 885    | 1                        | NR            |
| 370    | 0                        | NR            | 500    | 438                      | NR            | 630    | 797                      | NR            | 760    | 19                       | NR            | 890    | 0                        | NR            |
| 375    | 0                        | NR            | 505    | 491                      | NR            | 635    | 735                      | NR            | 765    | 16                       | NR            | 895    | 0                        | NR            |
| 380    | 0                        | NR            | 510    | 533                      | NR            | 640    | 672                      | NR            | 770    | 14                       | NR            | 900    | 0                        | NR            |
| 385    | 0                        | NR            | 515    | 566                      | NR            | 645    | 607                      | NR            | 775    | 12                       | NR            | 905    | 0                        | NR            |
| 390    | 0                        | NR            | 520    | 592                      | NR            | 650    | 546                      | NR            | 780    | 10                       | NR            | 910    | 0                        | NR            |
| 395    | 1                        | NR            | 525    | 608                      | NR            | 655    | 487                      | NR            | 785    | 9                        | NR            | 915    | 0                        | NR            |
| 400    | 3                        | NR            | 530    | 625                      | NR            | 660    | 429                      | NR            | 790    | 7                        | NR            | 920    | 0                        | NR            |
| 405    | 6                        | NR            | 535    | 642                      | NR            | 665    | 378                      | NR            | 795    | 6                        | NR            | 925    | 0                        | NR            |
| 410    | 12                       | NR            | 540    | 657                      | NR            | 670    | 329                      | NR            | 800    | 5                        | NR            | 930    | 0                        | NR            |
| 415    | 22                       | NR            | 545    | 677                      | NR            | 675    | 286                      | NR            | 805    | 5                        | NR            | 935    | 0                        | NR            |
| 420    | 43                       | NR            | 550    | 701                      | NR            | 680    | 248                      | NR            | 810    | 4                        | NR            | 940    | 0                        | NR            |
| 425    | 80                       | NR            | 555    | 728                      | NR            | 685    | 213                      | NR            | 815    | 3                        | NR            | 945    | 0                        | NR            |
| 430    | 140                      | NR            | 560    | 757                      | NR            | 690    | 184                      | NR            | 820    | 3                        | NR            | 950    | 0                        | NR            |
| 435    | 243                      | NR            | 565    | 793                      | NR            | 695    | 156                      | NR            | 825    | 3                        | NR            | 955    | 0                        | NR            |
| 440    | 412                      | NR            | 570    | 831                      | NR            | 700    | 134                      | NR            | 830    | 2                        | NR            | 960    | 0                        | NR            |
| 445    | 610                      | NR            | 575    | 872                      | NR            | 705    | 114                      | NR            | 835    | 2                        | NR            | 965    | 0                        | NR            |
| 450    | 597                      | NR            | 580    | 911                      | NR            | 710    | 97                       | NR            | 840    | 2                        | NR            | 970    | 0                        | NR            |
| 455    | 412                      | NR            | 585    | 944                      | NR            | 715    | 83                       | NR            | 845    | 1                        | NR            | 975    | 0                        | NR            |
| 460    | 330                      | NR            | 590    | 974                      | NR            | 720    | 70                       | NR            | 850    | 1                        | NR            | 980    | 0                        | NR            |
| 465    | 274                      | NR            | 595    | 992                      | NR            | 725    | 60                       | NR            | 855    | 1                        | NR            | 985    | 0                        | NR            |
| 470    | 211                      | NR            | 600    | 999                      | NR            | 730    | 51                       | NR            | 860    | 1                        | NR            | 990    | 0                        | NR            |
| 475    | 200                      | NR            | 605    | 992                      | NR            | 735    | 43                       | NR            | 865    | 1                        | NR            | 995    | 0                        | NR            |
| 480    | 220                      | NR            | 610    | 975                      | NR            | 740    | 36                       | NR            | 870    | 1                        | NR            | 1000   | 0                        | NR            |
| 485    | 255                      | NR            | 615    | 944                      | NR            | 745    | 31                       | NR            | 875    | 1                        | NR            |        |                          |               |

**Summary**

$R_f = 86.6$   
 $R_g = 95.9$   
 $CIE R_a = 83.5$   
 $R_9 = 6.3$



**Color Vector Graphics**



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

|            |             |            |            |
|------------|-------------|------------|------------|
| CES01 = 86 | CES26 = 85  | CES51 = 97 | CES76 = 81 |
| CES02 = 62 | CES27 = 95  | CES52 = 96 | CES77 = 87 |
| CES03 = 31 | CES28 = 94  | CES53 = 91 | CES78 = 80 |
| CES04 = 70 | CES29 = 87  | CES54 = 92 | CES79 = 93 |
| CES05 = 49 | CES30 = 93  | CES55 = 92 | CES80 = 91 |
| CES06 = 51 | CES31 = 89  | CES56 = 88 | CES81 = 77 |
| CES07 = 41 | CES32 = 84  | CES57 = 87 | CES82 = 96 |
| CES08 = 40 | CES33 = 91  | CES58 = 88 | CES83 = 95 |
| CES09 = 29 | CES34 = 91  | CES59 = 93 | CES84 = 92 |
| CES10 = 75 | CES35 = 95  | CES60 = 94 | CES85 = 80 |
| CES11 = 58 | CES36 = 90  | CES61 = 91 | CES86 = 72 |
| CES12 = 64 | CES37 = 95  | CES62 = 95 | CES87 = 86 |
| CES13 = 43 | CES38 = 100 | CES63 = 88 | CES88 = 88 |
| CES14 = 74 | CES39 = 97  | CES64 = 85 | CES89 = 77 |
| CES15 = 71 | CES40 = 94  | CES65 = 80 | CES90 = 88 |
| CES16 = 47 | CES41 = 97  | CES66 = 84 | CES91 = 81 |
| CES17 = 49 | CES42 = 96  | CES67 = 82 | CES92 = 67 |
| CES18 = 56 | CES43 = 93  | CES68 = 85 | CES93 = 81 |
| CES19 = 72 | CES44 = 99  | CES69 = 89 | CES94 = 63 |
| CES20 = 66 | CES45 = 95  | CES70 = 81 | CES95 = 76 |
| CES21 = 86 | CES46 = 91  | CES71 = 79 | CES96 = 84 |
| CES22 = 78 | CES47 = 93  | CES72 = 93 | CES97 = 92 |
| CES23 = 91 | CES48 = 85  | CES73 = 76 | CES98 = 86 |
| CES24 = 90 | CES49 = 92  | CES74 = 95 | CES99 = 77 |
| CES25 = 72 | CES50 = 96  | CES75 = 80 |            |



Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)