

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: P1435191

Luminaire Tested: **GALN-SB5A-722-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: P1435191  
 Test Lab: INNOVATION CENTER(G1)  
 Issue Date: 03/24/202  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: McGRAW-EDISON  
 Catalog Number: GALN-SB5A-722-U-T4LG  
 Description: GALLEON II AREA AND ROADWAY HIGH DENSITY LUMINAIRE 350mA 5xLight  
 Square PACKAGE 70CRI 2200K FIXTURE w/ TYPE IV LOW GLARE  
 Light Source: (130) 2200K CCT, 70 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               |

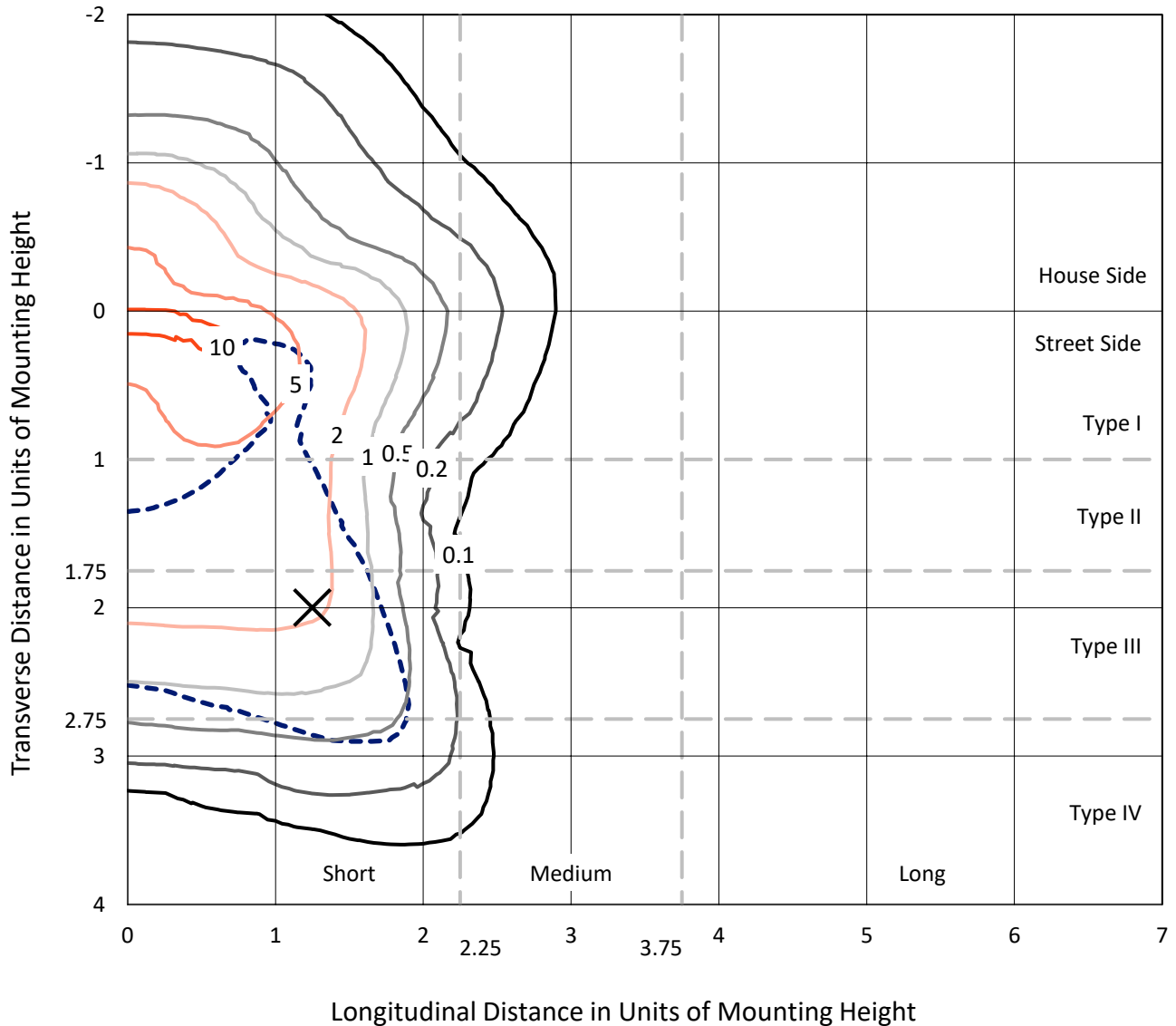
**Summary**

Lumens per Lamp: N/A  
 Luminaire Lumens: 18323.6 lumens  
 Efficiency: N/A  
 Efficacy: 129.3 lumens/watt  
 Luminous Opening: Rectangular (W 1.5' x L: 1' x H: 0')  
 IES Classification: Type IV - Short  
 BUG Rating: B3 - U0 - G3  
  
 Input Watts (W): 141.7  
 Input Voltage (V): 120  
 Input Current (A<sub>in</sub>): 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

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### Iso-Footcandle Lines of Horizontal Illumination

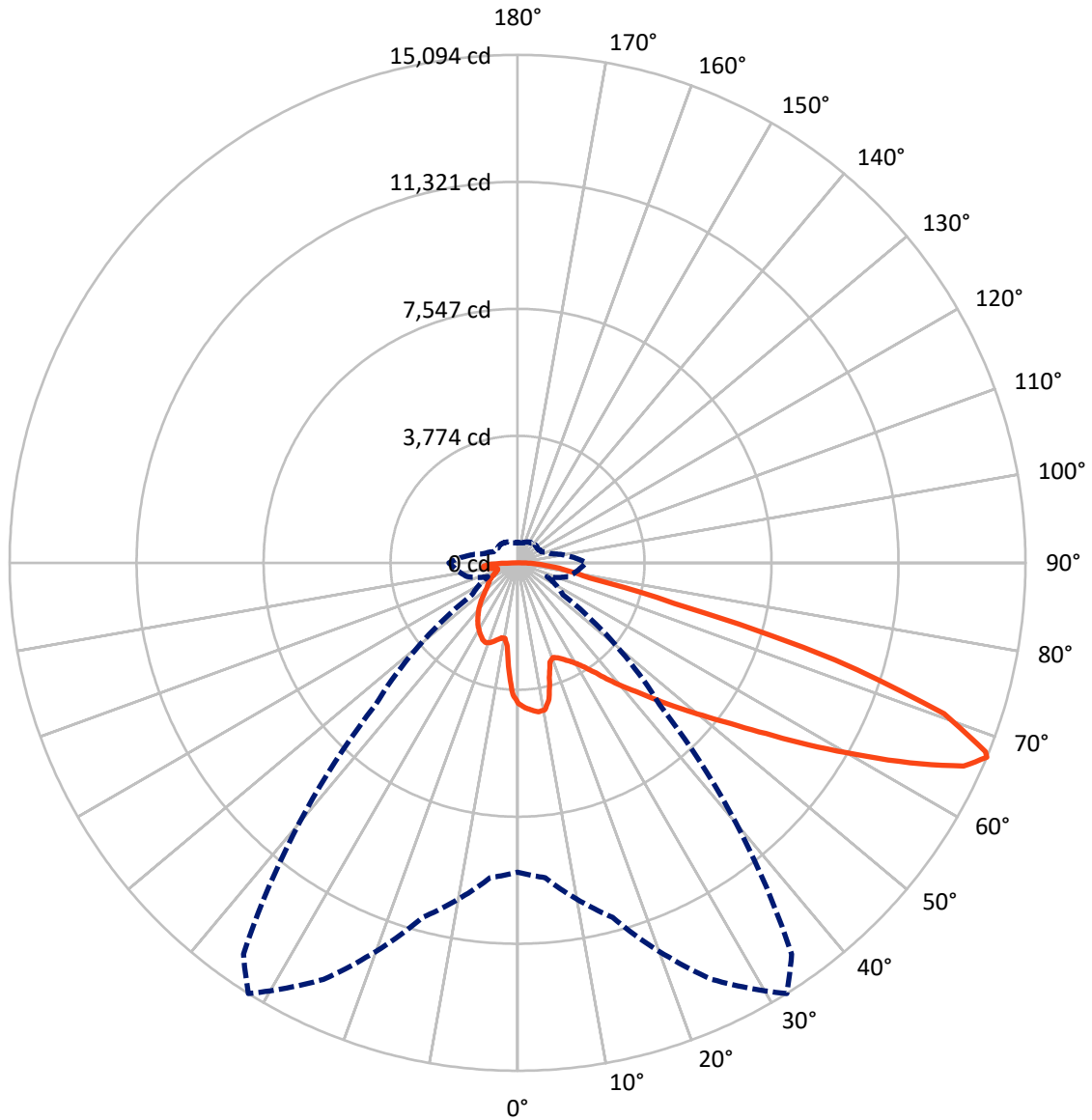
✕ Max cd  
 - - - 1/2 Max cd



Based on 20 foot mounting height. Maximum calculated value = 11.3 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    | 4338.0   | 0.0    | 4338.0  |
|                    | % Fixture | 23.7     | 0.0    | 23.7    |
| <b>Street Side</b> | Lumens    | 13985.5  | 0.0    | 13985.5 |
|                    | % Fixture | 76.3     | 0.0    | 76.3    |
| <b>Total</b>       | Lumens    | 18323.6  | 0.0    | 18323.6 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**Coefficient of Utilization**

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 365.8   | 2.0       |
| 10°-20°   | 971.2   | 5.3       |
| 20°-30°   | 1586.1  | 8.7       |
| 30°-40°   | 2337.7  | 12.8      |
| 40°-50°   | 3223.9  | 17.6      |
| 50°-60°   | 4072.7  | 22.2      |
| 60°-70°   | 3941.6  | 21.5      |
| 70°-80°   | 1406.7  | 7.7       |
| 80°-90°   | 417.7   | 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°    | 18323.6 | 100.0     |
| 0°-180°   | 18323.6 | 100.0     |

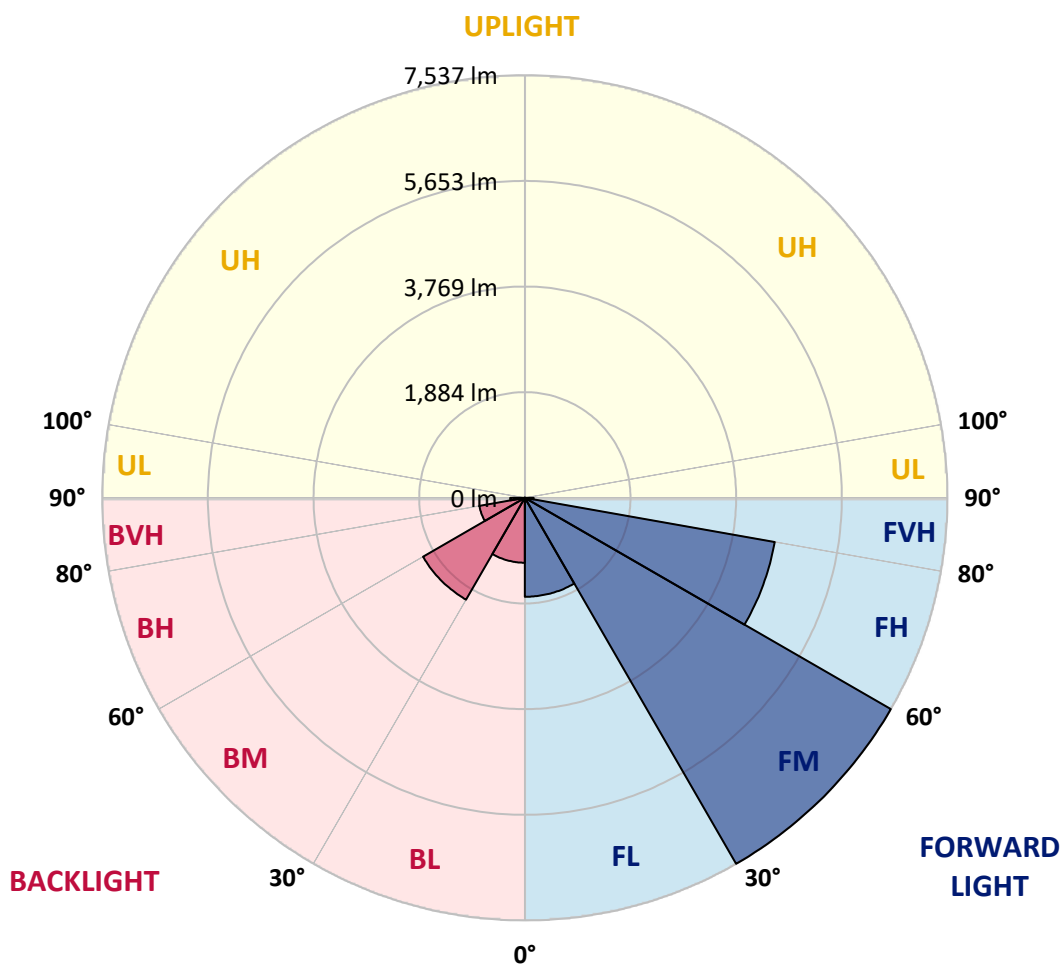


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**LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:**

| Zone           | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|----------------|--------|-----------|-------------------------|------|---------|
|                |        |           | B                       | U    | G       |
| FL (0°-30°)    | 1765.5 | 9.6       |                         |      |         |
| FM (30°-60°)   | 7537.1 | 41.1      |                         |      |         |
| FH (60°-80°)   | 4525.5 | 24.7      |                         |      | G2/5000 |
| FVH (80°-90°)  | 157.4  | 0.9       |                         |      | G2/225  |
| BL (0°-30°)    | 1157.6 | 6.3       | B3/2500                 |      |         |
| BM (30°-60°)   | 2097.2 | 11.4      | B2/2500                 |      |         |
| BH (60°-80°)   | 822.9  | 4.5       | B2/1000                 |      | G2/1000 |
| BVH (80°-90°)  | 260.3  | 1.4       |                         |      | G3/500  |
| UL (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B3-U0-G3**  
 Type IV Short





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 32°     | 35°     | 45°    | 55°    | 65°    | 75°    | 85°    |
|-------|---------|---------|---------|---------|---------|---------|--------|--------|--------|--------|--------|
| 0°    | 4186.6  | 4186.6  | 4186.6  | 4186.6  | 4186.6  | 4186.6  | 4186.6 | 4186.6 | 4186.6 | 4186.6 | 4186.6 |
| 2.5°  | 4345.2  | 4333.0  | 4320.8  | 4329.0  | 4312.7  | 4308.6  | 4288.3 | 4280.1 | 4255.7 | 4251.7 | 4206.9 |
| 5°    | 4434.7  | 4410.3  | 4406.3  | 4414.4  | 4398.1  | 4398.1  | 4381.9 | 4369.6 | 4333.0 | 4312.7 | 4247.6 |
| 7.5°  | 4434.7  | 4430.7  | 4438.8  | 4467.3  | 4471.4  | 4471.4  | 4471.4 | 4475.4 | 4438.8 | 4410.3 | 4308.6 |
| 10°   | 4182.5  | 4141.8  | 4231.3  | 4373.7  | 4442.9  | 4483.6  | 4556.8 | 4601.6 | 4573.1 | 4552.7 | 4414.4 |
| 12.5° | 3429.8  | 3433.9  | 3576.3  | 3881.4  | 4158.1  | 4276.1  | 4581.2 | 4744.0 | 4756.2 | 4723.6 | 4548.7 |
| 15°   | 2909.0  | 2929.4  | 3002.6  | 3222.3  | 3539.7  | 3714.6  | 4438.8 | 4870.1 | 4967.7 | 4935.2 | 4711.4 |
| 17.5° | 2750.4  | 2762.6  | 2795.1  | 2921.2  | 3100.3  | 3242.7  | 4052.3 | 4951.5 | 5224.1 | 5183.4 | 4894.5 |
| 20°   | 2725.9  | 2734.1  | 2774.8  | 2880.6  | 3002.6  | 3084.0  | 3657.6 | 4886.4 | 5464.1 | 5447.8 | 5061.3 |
| 22.5° | 2730.0  | 2738.2  | 2791.0  | 2937.5  | 3063.6  | 3132.8  | 3531.5 | 4735.8 | 5716.3 | 5732.6 | 5232.2 |
| 25°   | 2738.2  | 2742.2  | 2823.6  | 3018.9  | 3177.6  | 3263.0  | 3612.9 | 4601.6 | 5927.9 | 6066.2 | 5419.3 |
| 27.5° | 2782.9  | 2795.1  | 2905.0  | 3124.7  | 3311.8  | 3409.5  | 3804.1 | 4646.3 | 6159.8 | 6444.6 | 5643.1 |
| 30°   | 2905.0  | 2913.1  | 3047.4  | 3275.2  | 3478.6  | 3580.3  | 4032.0 | 4825.3 | 6444.6 | 6835.2 | 5862.8 |
| 32.5° | 3096.2  | 3104.3  | 3258.9  | 3494.9  | 3714.6  | 3836.7  | 4329.0 | 5167.1 | 6762.0 | 7246.1 | 6082.5 |
| 35°   | 3360.6  | 3364.7  | 3539.7  | 3791.9  | 4023.8  | 4162.2  | 4674.8 | 5553.6 | 7091.5 | 7596.0 | 6245.3 |
| 37.5° | 3673.9  | 3702.4  | 3881.4  | 4145.9  | 4418.5  | 4544.6  | 5081.7 | 6005.2 | 7384.5 | 7893.0 | 6338.8 |
| 40°   | 4105.2  | 4113.3  | 4288.3  | 4544.6  | 4833.5  | 4955.5  | 5488.5 | 6432.4 | 7705.9 | 8068.0 | 6424.3 |
| 42.5° | 4548.7  | 4617.8  | 4764.3  | 5049.1  | 5264.7  | 5362.4  | 5952.3 | 6823.0 | 7962.2 | 8076.1 | 6387.7 |
| 45°   | 5142.7  | 5195.6  | 5342.0  | 5594.3  | 5809.9  | 5923.8  | 6452.8 | 7181.0 | 8092.4 | 8007.0 | 6306.3 |
| 47.5° | 5822.1  | 5854.7  | 5972.7  | 6200.5  | 6440.6  | 6521.9  | 6973.5 | 7384.5 | 8141.2 | 7958.1 | 6269.7 |
| 50°   | 6623.6  | 6623.6  | 6709.1  | 6904.4  | 7124.1  | 7238.0  | 7453.6 | 7506.5 | 8283.6 | 7872.7 | 6363.3 |
| 52.5° | 7299.0  | 7331.6  | 7445.5  | 7722.2  | 7941.9  | 8072.1  | 7827.9 | 7693.7 | 7994.8 | 7396.7 | 6391.7 |
| 55°   | 7945.9  | 7982.5  | 8238.9  | 8584.7  | 8959.0  | 9101.4  | 8295.8 | 7600.1 | 7022.4 | 6700.9 | 6196.4 |
| 57.5° | 8564.4  | 8641.7  | 8963.1  | 9638.5  | 10204.0 | 10191.8 | 8889.8 | 6762.0 | 5732.6 | 5932.0 | 5769.2 |
| 60°   | 9426.9  | 9508.3  | 10020.9 | 10871.2 | 11562.9 | 11274.0 | 8898.0 | 5626.8 | 4467.3 | 4735.8 | 4967.7 |
| 62.5° | 10147.0 | 10285.4 | 11038.0 | 12453.9 | 13088.6 | 12637.0 | 8161.6 | 4308.6 | 2966.0 | 3303.7 | 3840.7 |
| 65°   | 10081.9 | 10265.0 | 11432.7 | 13617.5 | 14565.5 | 14146.4 | 7083.4 | 2725.9 | 1529.8 | 2258.1 | 2689.3 |
| 67°   | 9195.0  | 9394.3  | 10907.9 | 13658.2 | 15094.4 | 14199.3 | 5980.8 | 1647.8 | 972.4  | 1566.4 | 1867.5 |
| 67.5° | 8686.4  | 8979.3  | 10647.5 | 13580.9 | 14996.8 | 13975.6 | 5484.4 | 1379.2 | 915.4  | 1456.5 | 1700.7 |
| 70°   | 5342.0  | 5814.0  | 7990.7  | 12006.4 | 13442.6 | 11697.2 | 3047.4 | 781.2  | 744.5  | 976.5  | 1175.8 |
| 72.5° | 1607.1  | 1749.5  | 3084.0  | 7701.8  | 9866.3  | 8670.1  | 1371.1 | 602.1  | 667.2  | 785.2  | 907.3  |
| 75°   | 781.2   | 834.1   | 1273.5  | 3149.1  | 4805.0  | 4780.6  | 764.9  | 516.7  | 618.4  | 659.1  | 716.1  |
| 77.5° | 500.4   | 533.0   | 793.4   | 1761.7  | 2201.1  | 1961.1  | 553.3  | 451.6  | 549.3  | 541.1  | 533.0  |
| 80°   | 313.3   | 329.6   | 508.6   | 1021.2  | 1623.4  | 1354.8  | 406.9  | 370.2  | 472.0  | 419.1  | 378.4  |
| 82.5° | 203.4   | 223.8   | 325.5   | 622.5   | 1159.5  | 1009.0  | 268.5  | 264.5  | 390.6  | 333.6  | 292.9  |
| 85°   | 134.3   | 150.5   | 207.5   | 366.2   | 687.6   | 720.1   | 174.9  | 183.1  | 301.1  | 252.3  | 223.8  |
| 87.5° | 48.8    | 61.0    | 105.8   | 162.7   | 321.4   | 398.7   | 73.2   | 69.2   | 146.5  | 118.0  | 93.6   |
| 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: P1435191  
 CATALOG NUMBER: GALN-SB5A-722-U-T4LG

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 4186.6 | 4186.6 | 4186.6 | 4186.6 | 4186.6 | 4186.6 | 4186.6 | 4186.6 | 4186.6 | 4186.6 | 4186.6 |
| 2.5°  | 4198.8 | 4186.6 | 4129.6 | 4080.8 | 4044.2 | 3995.3 | 3942.4 | 3881.4 | 3840.7 | 3848.9 | 3836.7 |
| 5°    | 4219.1 | 4186.6 | 4076.7 | 3909.9 | 3747.2 | 3543.7 | 3283.3 | 3128.7 | 3010.7 | 2949.7 | 2966.0 |
| 7.5°  | 4263.9 | 4206.9 | 3975.0 | 3637.3 | 3214.2 | 2799.2 | 2542.9 | 2396.4 | 2327.2 | 2298.7 | 2294.7 |
| 10°   | 4341.2 | 4243.5 | 3844.8 | 3214.2 | 2660.8 | 2380.1 | 2286.5 | 2245.9 | 2237.7 | 2237.7 | 2233.6 |
| 12.5° | 4434.7 | 4280.1 | 3625.1 | 2803.2 | 2396.4 | 2294.7 | 2278.4 | 2282.5 | 2294.7 | 2306.9 | 2286.5 |
| 15°   | 4548.7 | 4296.4 | 3352.5 | 2555.1 | 2343.5 | 2319.1 | 2343.5 | 2372.0 | 2392.3 | 2408.6 | 2388.3 |
| 17.5° | 4662.6 | 4280.1 | 3096.2 | 2437.1 | 2351.6 | 2384.2 | 2433.0 | 2477.8 | 2490.0 | 2514.4 | 2498.1 |
| 20°   | 4744.0 | 4223.2 | 2876.5 | 2392.3 | 2372.0 | 2445.2 | 2506.2 | 2555.1 | 2579.5 | 2595.8 | 2579.5 |
| 22.5° | 4805.0 | 4149.9 | 2717.8 | 2347.6 | 2372.0 | 2461.5 | 2534.7 | 2591.7 | 2620.2 | 2636.4 | 2616.1 |
| 25°   | 4857.9 | 4048.2 | 2595.8 | 2282.5 | 2323.2 | 2408.6 | 2490.0 | 2546.9 | 2587.6 | 2612.0 | 2599.8 |
| 27.5° | 4923.0 | 3966.9 | 2481.8 | 2184.8 | 2221.4 | 2302.8 | 2388.3 | 2457.4 | 2534.7 | 2575.4 | 2567.3 |
| 30°   | 4996.2 | 3926.2 | 2372.0 | 2079.0 | 2103.5 | 2184.8 | 2286.5 | 2380.1 | 2485.9 | 2538.8 | 2538.8 |
| 32.5° | 5081.7 | 3897.7 | 2270.3 | 1977.3 | 1997.7 | 2087.2 | 2184.8 | 2270.3 | 2384.2 | 2469.6 | 2465.6 |
| 35°   | 5118.3 | 3865.1 | 2188.9 | 1883.8 | 1924.4 | 1997.7 | 2075.0 | 2131.9 | 2249.9 | 2351.6 | 2359.8 |
| 37.5° | 5154.9 | 3852.9 | 2148.2 | 1810.5 | 1843.1 | 1900.0 | 1940.7 | 1969.2 | 2079.0 | 2184.8 | 2188.9 |
| 40°   | 5199.6 | 3909.9 | 2176.7 | 1761.7 | 1733.2 | 1790.2 | 1810.5 | 1826.8 | 1883.8 | 1952.9 | 1952.9 |
| 42.5° | 5171.2 | 3950.6 | 2241.8 | 1716.9 | 1599.0 | 1664.0 | 1672.2 | 1668.1 | 1672.2 | 1676.3 | 1672.2 |
| 45°   | 5097.9 | 3909.9 | 2241.8 | 1647.8 | 1456.5 | 1525.7 | 1521.6 | 1501.3 | 1468.8 | 1383.3 | 1371.1 |
| 47.5° | 5081.7 | 3885.5 | 2156.3 | 1533.9 | 1314.1 | 1371.1 | 1379.2 | 1338.6 | 1245.0 | 1155.5 | 1127.0 |
| 50°   | 5150.8 | 3930.2 | 2022.1 | 1395.5 | 1192.1 | 1240.9 | 1261.3 | 1192.1 | 1086.3 | 992.7  | 976.5  |
| 52.5° | 5252.5 | 3987.2 | 1826.8 | 1245.0 | 1090.4 | 1139.2 | 1163.6 | 1086.3 | 976.5  | 903.2  | 895.1  |
| 55°   | 5240.3 | 3987.2 | 1607.1 | 1106.7 | 1013.1 | 1049.7 | 1090.4 | 1009.0 | 923.6  | 882.9  | 878.8  |
| 57.5° | 4975.9 | 3836.7 | 1444.3 | 1009.0 | 939.8  | 972.4  | 1025.3 | 948.0  | 866.6  | 874.7  | 886.9  |
| 60°   | 4459.2 | 3446.1 | 1322.3 | 943.9  | 874.7  | 907.3  | 964.3  | 874.7  | 769.0  | 740.5  | 740.5  |
| 62.5° | 3673.9 | 2839.9 | 1224.6 | 878.8  | 813.7  | 854.4  | 882.9  | 764.9  | 695.7  | 663.2  | 663.2  |
| 65°   | 2754.4 | 2197.0 | 1122.9 | 825.9  | 760.8  | 805.6  | 773.0  | 716.1  | 646.9  | 622.5  | 626.6  |
| 67°   | 2042.4 | 1704.7 | 1037.5 | 781.2  | 728.3  | 748.6  | 724.2  | 683.5  | 614.4  | 594.0  | 614.4  |
| 67.5° | 1834.9 | 1619.3 | 1017.1 | 769.0  | 720.1  | 736.4  | 712.0  | 679.5  | 606.2  | 585.9  | 606.2  |
| 70°   | 1261.3 | 1245.0 | 907.3  | 712.0  | 675.4  | 659.1  | 671.3  | 630.6  | 569.6  | 561.5  | 581.8  |
| 72.5° | 960.2  | 992.7  | 813.7  | 663.2  | 626.6  | 606.2  | 634.7  | 594.0  | 533.0  | 545.2  | 565.5  |
| 75°   | 752.7  | 801.5  | 728.3  | 594.0  | 569.6  | 573.7  | 630.6  | 614.4  | 565.5  | 577.7  | 581.8  |
| 77.5° | 557.4  | 646.9  | 622.5  | 516.7  | 496.4  | 553.3  | 712.0  | 760.8  | 675.4  | 655.0  | 626.6  |
| 80°   | 406.9  | 463.8  | 524.8  | 427.2  | 415.0  | 533.0  | 878.8  | 972.4  | 834.1  | 752.7  | 732.3  |
| 82.5° | 301.1  | 325.5  | 431.3  | 341.8  | 301.1  | 476.0  | 976.5  | 1143.3 | 992.7  | 838.1  | 813.7  |
| 85°   | 215.6  | 252.3  | 341.8  | 252.3  | 199.4  | 390.6  | 956.1  | 1118.9 | 984.6  | 793.4  | 773.0  |
| 87.5° | 77.3   | 109.9  | 146.5  | 113.9  | 101.7  | 268.5  | 789.3  | 805.6  | 614.4  | 280.7  | 284.8  |
| 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: SP1-2407-184-2

Test Date: 10/09/2024

Luminaire Tested: GSS-SB1A-722-U-5WQ

Data in this report applies to families of products including GSS-SB1A-722-U-5WQ

**Test Information**

Test Method: LM-79-2019  
 Report Number: SP1-2407-184-2  
 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-722-U-5WQ**  
 Description: GALLEON II SITE SLIM 1SQ 350MA 5WQ HIGH DENSITY LIGHTSQUARE WITH 70 CRI  
 2200K CCT 26 LEDS

**Spectral Parameters**

CCT (K): 2160  
 CIE u': 0.2927  
 CIE v': 0.5388  
 Duv: 0.0015  
 CIE x: 0.5130  
 CIE y: 0.4197  
 CIE z: 0.0674  
 Peak Wavelength (nm): 609  
 Dominant Wavelength (nm): 587  
 Purity: 79.96089  
 Rf: 70.6  
 Rg: 97.6

|           |      |      |       |
|-----------|------|------|-------|
| CRI (Ra): | 71.9 |      |       |
| R1:       | 68.7 | R9:  | -17.8 |
| R2:       | 82.6 | R10: | 60.5  |
| R3:       | 95.5 | R11: | 60.2  |
| R4:       | 66.4 | R12: | 48.2  |
| R5:       | 65.4 | R13: | 70.7  |
| R6:       | 75.9 | R14: | 96.8  |
| R7:       | 77.2 | R15: | 61.8  |
| R8:       | 43.5 |      |       |



**Test Conditions**

Stabilization Time: 21M  
 Operation Time: 1H 21M  
 Sphere Temperature (°C): 25.2

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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 2200K 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    | 27                       | NR            | 620    | 966                      | NR            | 750    | 46                       | NR            | 880    | 1                        | NR            |
| 365    | 0                        | NR            | 495    | 42                       | NR            | 625    | 930                      | NR            | 755    | 39                       | NR            | 885    | 1                        | NR            |
| 370    | 0                        | NR            | 500    | 67                       | NR            | 630    | 888                      | NR            | 760    | 34                       | NR            | 890    | 1                        | NR            |
| 375    | 0                        | NR            | 505    | 101                      | NR            | 635    | 835                      | NR            | 765    | 30                       | NR            | 895    | 1                        | NR            |
| 380    | 0                        | NR            | 510    | 139                      | NR            | 640    | 778                      | NR            | 770    | 26                       | NR            | 900    | 1                        | NR            |
| 385    | 0                        | NR            | 515    | 183                      | NR            | 645    | 717                      | NR            | 775    | 22                       | NR            | 905    | 1                        | NR            |
| 390    | 0                        | NR            | 520    | 224                      | NR            | 650    | 656                      | NR            | 780    | 19                       | NR            | 910    | 1                        | NR            |
| 395    | 0                        | NR            | 525    | 262                      | NR            | 655    | 595                      | NR            | 785    | 17                       | NR            | 915    | 1                        | NR            |
| 400    | 1                        | NR            | 530    | 299                      | NR            | 660    | 536                      | NR            | 790    | 15                       | NR            | 920    | 1                        | NR            |
| 405    | 3                        | NR            | 535    | 332                      | NR            | 665    | 480                      | NR            | 795    | 13                       | NR            | 925    | 1                        | NR            |
| 410    | 7                        | NR            | 540    | 365                      | NR            | 670    | 425                      | NR            | 800    | 11                       | NR            | 930    | 1                        | NR            |
| 415    | 17                       | NR            | 545    | 400                      | NR            | 675    | 376                      | NR            | 805    | 10                       | NR            | 935    | 0                        | NR            |
| 420    | 36                       | NR            | 550    | 437                      | NR            | 680    | 332                      | NR            | 810    | 8                        | NR            | 940    | 0                        | NR            |
| 425    | 67                       | NR            | 555    | 479                      | NR            | 685    | 291                      | NR            | 815    | 8                        | NR            | 945    | 0                        | NR            |
| 430    | 105                      | NR            | 560    | 525                      | NR            | 690    | 255                      | NR            | 820    | 7                        | NR            | 950    | 0                        | NR            |
| 435    | 141                      | NR            | 565    | 579                      | NR            | 695    | 221                      | NR            | 825    | 6                        | NR            | 955    | 0                        | NR            |
| 440    | 169                      | NR            | 570    | 639                      | NR            | 700    | 192                      | NR            | 830    | 5                        | NR            | 960    | 0                        | NR            |
| 445    | 173                      | NR            | 575    | 703                      | NR            | 705    | 167                      | NR            | 835    | 4                        | NR            | 965    | 0                        | NR            |
| 450    | 136                      | NR            | 580    | 769                      | NR            | 710    | 144                      | NR            | 840    | 4                        | NR            | 970    | 0                        | NR            |
| 455    | 80                       | NR            | 585    | 832                      | NR            | 715    | 125                      | NR            | 845    | 3                        | NR            | 975    | 0                        | NR            |
| 460    | 45                       | NR            | 590    | 890                      | NR            | 720    | 109                      | NR            | 850    | 3                        | NR            | 980    | 0                        | NR            |
| 465    | 32                       | NR            | 595    | 937                      | NR            | 725    | 94                       | NR            | 855    | 3                        | NR            | 985    | 0                        | NR            |
| 470    | 23                       | NR            | 600    | 972                      | NR            | 730    | 81                       | NR            | 860    | 2                        | NR            | 990    | 0                        | NR            |
| 475    | 18                       | NR            | 605    | 992                      | NR            | 735    | 70                       | NR            | 865    | 2                        | NR            | 995    | 0                        | NR            |
| 480    | 18                       | NR            | 610    | 998                      | NR            | 740    | 61                       | NR            | 870    | 2                        | NR            | 1000   | 0                        | NR            |
| 485    | 20                       | NR            | 615    | 990                      | NR            | 745    | 53                       | NR            | 875    | 2                        | NR            |        |                          |               |

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**Scotopic Flux vs. Wavelength**



**Scotopic Lumens: NR**

**S/P: 0.8**

| 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    | 27                       | NR            | 620    | 966                      | NR            | 750    | 46                       | NR            | 880    | 1                        | NR            |
| 365    | 0                        | NR            | 495    | 42                       | NR            | 625    | 930                      | NR            | 755    | 39                       | NR            | 885    | 1                        | NR            |
| 370    | 0                        | NR            | 500    | 67                       | NR            | 630    | 888                      | NR            | 760    | 34                       | NR            | 890    | 1                        | NR            |
| 375    | 0                        | NR            | 505    | 101                      | NR            | 635    | 835                      | NR            | 765    | 30                       | NR            | 895    | 1                        | NR            |
| 380    | 0                        | NR            | 510    | 139                      | NR            | 640    | 778                      | NR            | 770    | 26                       | NR            | 900    | 1                        | NR            |
| 385    | 0                        | NR            | 515    | 183                      | NR            | 645    | 717                      | NR            | 775    | 22                       | NR            | 905    | 1                        | NR            |
| 390    | 0                        | NR            | 520    | 224                      | NR            | 650    | 656                      | NR            | 780    | 19                       | NR            | 910    | 1                        | NR            |
| 395    | 0                        | NR            | 525    | 262                      | NR            | 655    | 595                      | NR            | 785    | 17                       | NR            | 915    | 1                        | NR            |
| 400    | 1                        | NR            | 530    | 299                      | NR            | 660    | 536                      | NR            | 790    | 15                       | NR            | 920    | 1                        | NR            |
| 405    | 3                        | NR            | 535    | 332                      | NR            | 665    | 480                      | NR            | 795    | 13                       | NR            | 925    | 1                        | NR            |
| 410    | 7                        | NR            | 540    | 365                      | NR            | 670    | 425                      | NR            | 800    | 11                       | NR            | 930    | 1                        | NR            |
| 415    | 17                       | NR            | 545    | 400                      | NR            | 675    | 376                      | NR            | 805    | 10                       | NR            | 935    | 0                        | NR            |
| 420    | 36                       | NR            | 550    | 437                      | NR            | 680    | 332                      | NR            | 810    | 8                        | NR            | 940    | 0                        | NR            |
| 425    | 67                       | NR            | 555    | 479                      | NR            | 685    | 291                      | NR            | 815    | 8                        | NR            | 945    | 0                        | NR            |
| 430    | 105                      | NR            | 560    | 525                      | NR            | 690    | 255                      | NR            | 820    | 7                        | NR            | 950    | 0                        | NR            |
| 435    | 141                      | NR            | 565    | 579                      | NR            | 695    | 221                      | NR            | 825    | 6                        | NR            | 955    | 0                        | NR            |
| 440    | 169                      | NR            | 570    | 639                      | NR            | 700    | 192                      | NR            | 830    | 5                        | NR            | 960    | 0                        | NR            |
| 445    | 173                      | NR            | 575    | 703                      | NR            | 705    | 167                      | NR            | 835    | 4                        | NR            | 965    | 0                        | NR            |
| 450    | 136                      | NR            | 580    | 769                      | NR            | 710    | 144                      | NR            | 840    | 4                        | NR            | 970    | 0                        | NR            |
| 455    | 80                       | NR            | 585    | 832                      | NR            | 715    | 125                      | NR            | 845    | 3                        | NR            | 975    | 0                        | NR            |
| 460    | 45                       | NR            | 590    | 890                      | NR            | 720    | 109                      | NR            | 850    | 3                        | NR            | 980    | 0                        | NR            |
| 465    | 32                       | NR            | 595    | 937                      | NR            | 725    | 94                       | NR            | 855    | 3                        | NR            | 985    | 0                        | NR            |
| 470    | 23                       | NR            | 600    | 972                      | NR            | 730    | 81                       | NR            | 860    | 2                        | NR            | 990    | 0                        | NR            |
| 475    | 18                       | NR            | 605    | 992                      | NR            | 735    | 70                       | NR            | 865    | 2                        | NR            | 995    | 0                        | NR            |
| 480    | 18                       | NR            | 610    | 998                      | NR            | 740    | 61                       | NR            | 870    | 2                        | NR            | 1000   | 0                        | NR            |
| 485    | 20                       | NR            | 615    | 990                      | NR            | 745    | 53                       | NR            | 875    | 2                        | NR            |        |                          |               |

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**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: NR**

**M/P: 1.21**

| 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    | 27                       | NR            | 620    | 966                      | NR            | 750    | 46                       | NR            | 880    | 1                        | NR            |
| 365    | 0                        | NR            | 495    | 42                       | NR            | 625    | 930                      | NR            | 755    | 39                       | NR            | 885    | 1                        | NR            |
| 370    | 0                        | NR            | 500    | 67                       | NR            | 630    | 888                      | NR            | 760    | 34                       | NR            | 890    | 1                        | NR            |
| 375    | 0                        | NR            | 505    | 101                      | NR            | 635    | 835                      | NR            | 765    | 30                       | NR            | 895    | 1                        | NR            |
| 380    | 0                        | NR            | 510    | 139                      | NR            | 640    | 778                      | NR            | 770    | 26                       | NR            | 900    | 1                        | NR            |
| 385    | 0                        | NR            | 515    | 183                      | NR            | 645    | 717                      | NR            | 775    | 22                       | NR            | 905    | 1                        | NR            |
| 390    | 0                        | NR            | 520    | 224                      | NR            | 650    | 656                      | NR            | 780    | 19                       | NR            | 910    | 1                        | NR            |
| 395    | 0                        | NR            | 525    | 262                      | NR            | 655    | 595                      | NR            | 785    | 17                       | NR            | 915    | 1                        | NR            |
| 400    | 1                        | NR            | 530    | 299                      | NR            | 660    | 536                      | NR            | 790    | 15                       | NR            | 920    | 1                        | NR            |
| 405    | 3                        | NR            | 535    | 332                      | NR            | 665    | 480                      | NR            | 795    | 13                       | NR            | 925    | 1                        | NR            |
| 410    | 7                        | NR            | 540    | 365                      | NR            | 670    | 425                      | NR            | 800    | 11                       | NR            | 930    | 1                        | NR            |
| 415    | 17                       | NR            | 545    | 400                      | NR            | 675    | 376                      | NR            | 805    | 10                       | NR            | 935    | 0                        | NR            |
| 420    | 36                       | NR            | 550    | 437                      | NR            | 680    | 332                      | NR            | 810    | 8                        | NR            | 940    | 0                        | NR            |
| 425    | 67                       | NR            | 555    | 479                      | NR            | 685    | 291                      | NR            | 815    | 8                        | NR            | 945    | 0                        | NR            |
| 430    | 105                      | NR            | 560    | 525                      | NR            | 690    | 255                      | NR            | 820    | 7                        | NR            | 950    | 0                        | NR            |
| 435    | 141                      | NR            | 565    | 579                      | NR            | 695    | 221                      | NR            | 825    | 6                        | NR            | 955    | 0                        | NR            |
| 440    | 169                      | NR            | 570    | 639                      | NR            | 700    | 192                      | NR            | 830    | 5                        | NR            | 960    | 0                        | NR            |
| 445    | 173                      | NR            | 575    | 703                      | NR            | 705    | 167                      | NR            | 835    | 4                        | NR            | 965    | 0                        | NR            |
| 450    | 136                      | NR            | 580    | 769                      | NR            | 710    | 144                      | NR            | 840    | 4                        | NR            | 970    | 0                        | NR            |
| 455    | 80                       | NR            | 585    | 832                      | NR            | 715    | 125                      | NR            | 845    | 3                        | NR            | 975    | 0                        | NR            |
| 460    | 45                       | NR            | 590    | 890                      | NR            | 720    | 109                      | NR            | 850    | 3                        | NR            | 980    | 0                        | NR            |
| 465    | 32                       | NR            | 595    | 937                      | NR            | 725    | 94                       | NR            | 855    | 3                        | NR            | 985    | 0                        | NR            |
| 470    | 23                       | NR            | 600    | 972                      | NR            | 730    | 81                       | NR            | 860    | 2                        | NR            | 990    | 0                        | NR            |
| 475    | 18                       | NR            | 605    | 992                      | NR            | 735    | 70                       | NR            | 865    | 2                        | NR            | 995    | 0                        | NR            |
| 480    | 18                       | NR            | 610    | 998                      | NR            | 740    | 61                       | NR            | 870    | 2                        | NR            | 1000   | 0                        | NR            |
| 485    | 20                       | NR            | 615    | 990                      | NR            | 745    | 53                       | NR            | 875    | 2                        | NR            |        |                          |               |

**Summary**

$R_f = 70.6$   
 $R_g = 97.6$   
 CIE  $R_a = 71.9$   
 $R_9 = -17.8$



**Color Vector Graphics**



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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 87 | CES26 = 60 | CES51 = 74 | CES76 = 58 |
| CES02 = 65 | CES27 = 77 | CES52 = 77 | CES77 = 82 |
| CES03 = 32 | CES28 = 85 | CES53 = 65 | CES78 = 65 |
| CES04 = 72 | CES29 = 50 | CES54 = 77 | CES79 = 86 |
| CES05 = 52 | CES30 = 49 | CES55 = 74 | CES80 = 85 |
| CES06 = 53 | CES31 = 55 | CES56 = 64 | CES81 = 61 |
| CES07 = 44 | CES32 = 55 | CES57 = 60 | CES82 = 93 |
| CES08 = 43 | CES33 = 55 | CES58 = 64 | CES83 = 83 |
| CES09 = 29 | CES34 = 75 | CES59 = 84 | CES84 = 93 |
| CES10 = 79 | CES35 = 88 | CES60 = 89 | CES85 = 81 |
| CES11 = 62 | CES36 = 78 | CES61 = 84 | CES86 = 55 |
| CES12 = 68 | CES37 = 82 | CES62 = 68 | CES87 = 79 |
| CES13 = 45 | CES38 = 54 | CES63 = 68 | CES88 = 72 |
| CES14 = 75 | CES39 = 90 | CES64 = 69 | CES89 = 62 |
| CES15 = 72 | CES40 = 86 | CES65 = 66 | CES90 = 67 |
| CES16 = 49 | CES41 = 75 | CES66 = 64 | CES91 = 89 |
| CES17 = 51 | CES42 = 83 | CES67 = 63 | CES92 = 67 |
| CES18 = 57 | CES43 = 68 | CES68 = 71 | CES93 = 78 |
| CES19 = 74 | CES44 = 98 | CES69 = 81 | CES94 = 52 |
| CES20 = 68 | CES45 = 76 | CES70 = 65 | CES95 = 76 |
| CES21 = 89 | CES46 = 68 | CES71 = 64 | CES96 = 78 |
| CES22 = 81 | CES47 = 60 | CES72 = 88 | CES97 = 76 |
| CES23 = 92 | CES48 = 47 | CES73 = 59 | CES98 = 71 |
| CES24 = 92 | CES49 = 65 | CES74 = 85 | CES99 = 65 |
| CES25 = 74 | CES50 = 74 | CES75 = 66 |            |



Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)