

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: P1434756

Luminaire Tested: **GALN-SB4B-750-U-T3LG**

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: P1434756  
 Test Lab: INNOVATION CENTER(G1)  
 Issue Date: 03/24/202  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: McGRAW-EDISON  
 Catalog Number: GALN-SB4B-750-U-T3LG  
 Description: GALLEON II AREA AND ROADWAY HIGH DENSITY LUMINAIRE 450mA 4xLight  
 Square PACKAGE 70CRI 5000K FIXTURE w/ TYPE III LOW GLARE  
 Light Source: (104) 5000K 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**

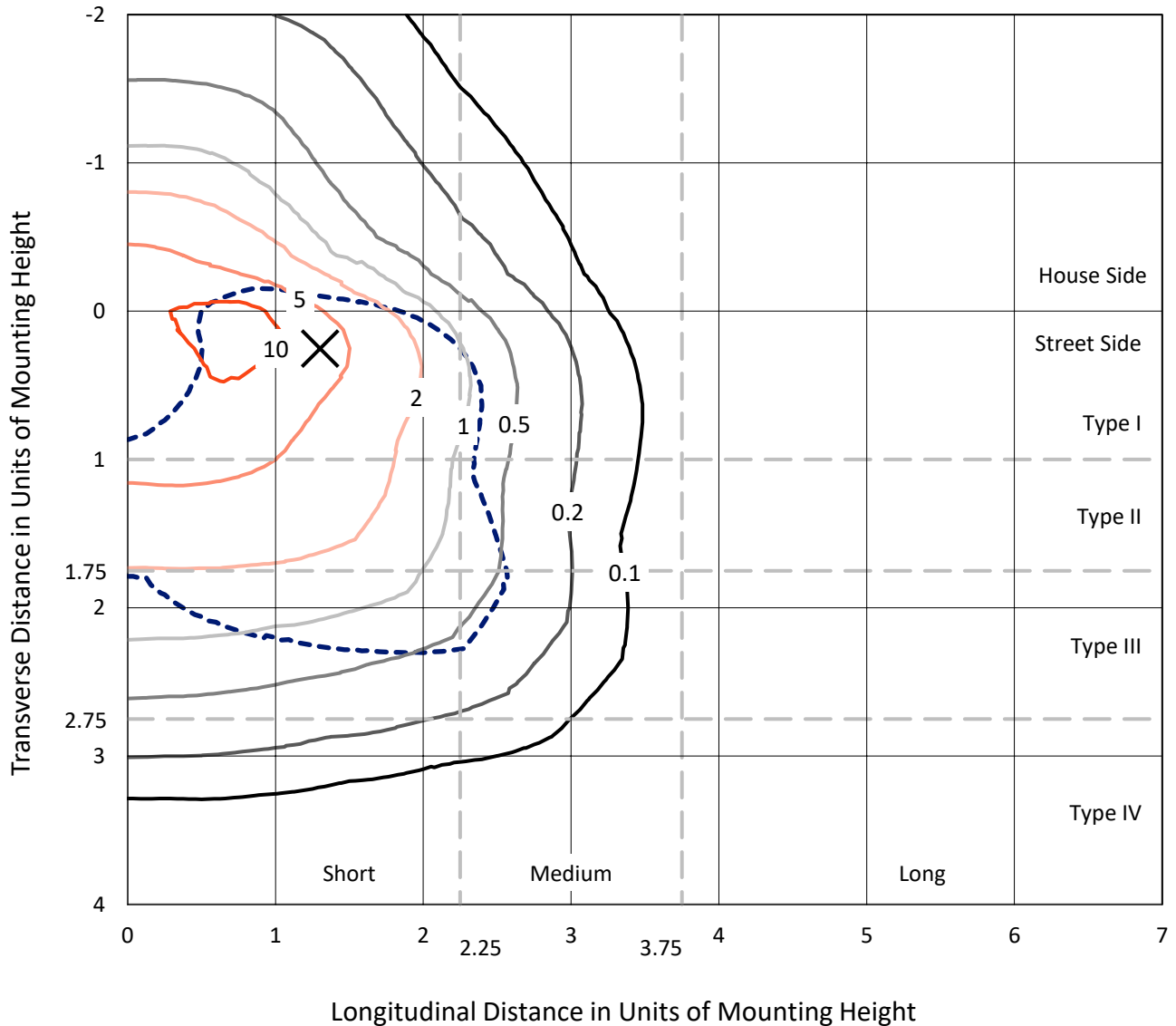
Lumens per Lamp: N/A  
 Luminaire Lumens: 23288.9 lumens  
 Efficiency: N/A  
 Efficacy: 158.4 lumens/watt  
 Luminous Opening: Rectangular (W 1' x L: 1' x H: 0')  
 IES Classification: Type III - Short  
 BUG Rating: B3 - U0 - G3

Input Watts (W): 147  
 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

REPORT NUMBER: P1434756  
 CATALOG NUMBER: GALN-SB4B-750-U-T3LG

### Iso-Footcandle Lines of Horizontal Illumination

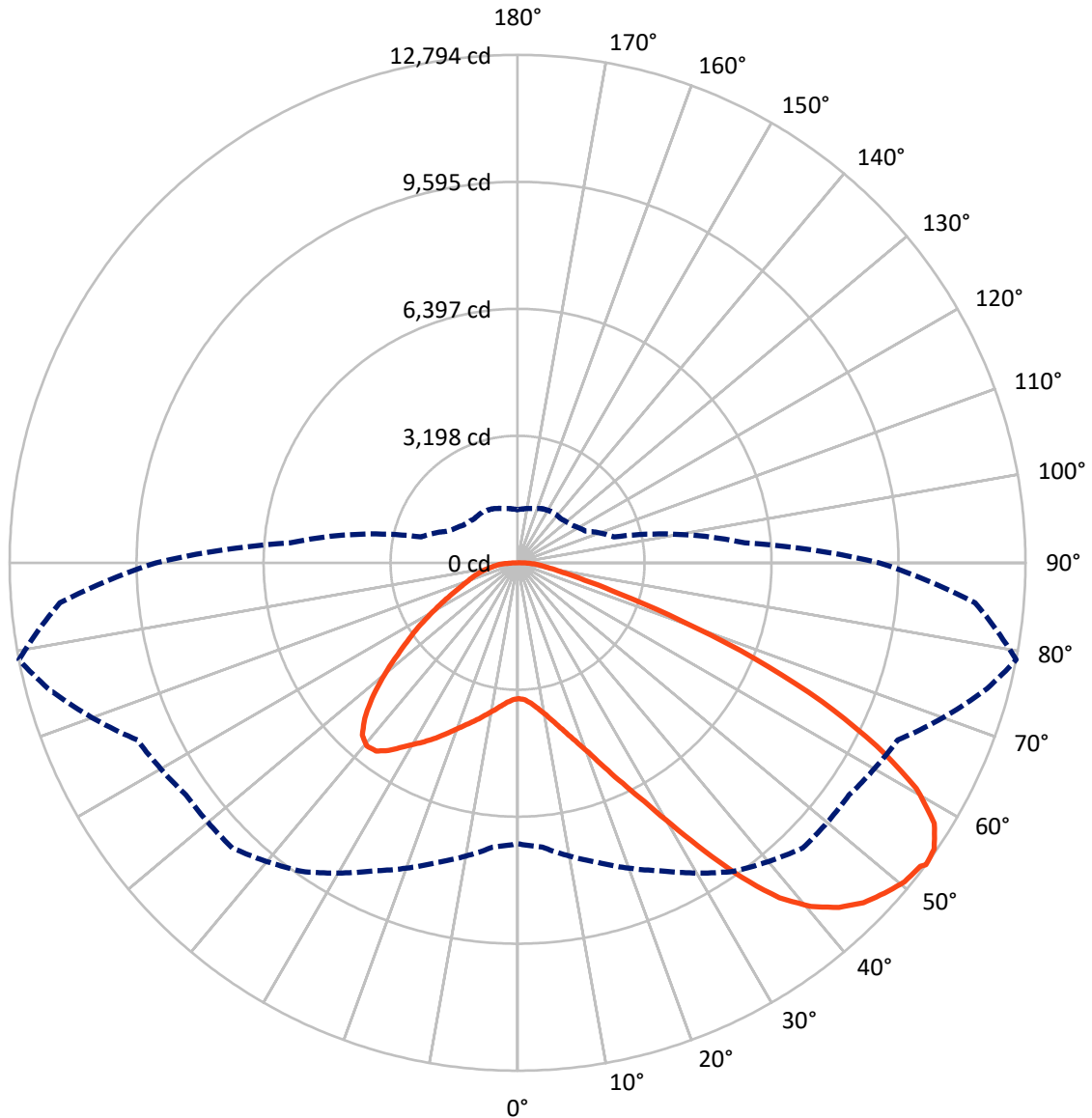
✕ Max cd  
 - - - 1/2 Max cd



Based on 20 foot mounting height. Maximum calculated value = 13.3 fc  
 Type III - Short - N/A

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### Luminous Intensity Polar Plot



— Vertical Plane Through 79-Deg Lateral      - - - Horizontal Cone Through 53-Deg Vertical

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**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 5871.0   | 0.0    | 5871.0  |
|                    | % Fixture | 25.2     | 0.0    | 25.2    |
| <b>Street Side</b> | Lumens    | 17418.0  | 0.0    | 17418.0 |
|                    | % Fixture | 74.8     | 0.0    | 74.8    |
| <b>Total</b>       | Lumens    | 23288.9  | 0.0    | 23288.9 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**Coefficient of Utilization**

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 325.8   | 1.4       |
| 10°-20°   | 1008.8  | 4.3       |
| 20°-30°   | 1928.7  | 8.3       |
| 30°-40°   | 3311.4  | 14.2      |
| 40°-50°   | 4638.3  | 19.9      |
| 50°-60°   | 5263.9  | 22.6      |
| 60°-70°   | 4616.1  | 19.8      |
| 70°-80°   | 1805.0  | 7.8       |
| 80°-90°   | 391.1   | 1.7       |
| 90°-100°  | 0.0     | 0.0       |
| 100°-110° | 0.0     | 0.0       |
| 110°-120° | 0.0     | 0.0       |
| 120°-130° | 0.0     | 0.0       |
| 130°-140° | 0.0     | 0.0       |
| 140°-150° | 0.0     | 0.0       |
| 150°-160° | 0.0     | 0.0       |
| 160°-170° | 0.0     | 0.0       |
| 170°-180° | 0.0     | 0.0       |
| 0°-90°    | 23288.9 | 100.0     |
| 0°-180°   | 23288.9 | 100.0     |

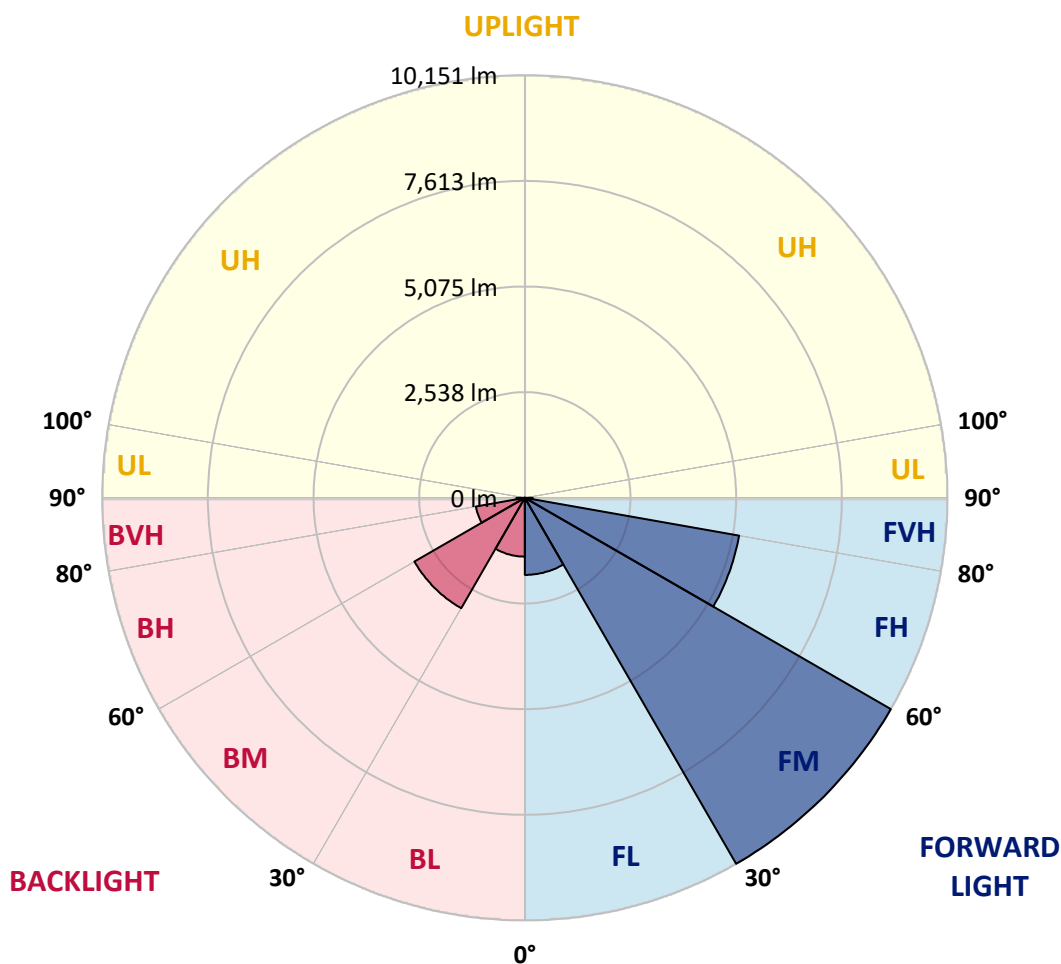


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**LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:**

| Zone |             | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|---------|-----------|-------------------------|------|---------|
|      |             |         |           | B                       | U    | G       |
| FL   | (0°-30°)    | 1851.3  | 7.9       |                         |      |         |
| FM   | (30°-60°)   | 10150.8 | 43.6      |                         |      |         |
| FH   | (60°-80°)   | 5226.2  | 22.4      |                         |      | G3/7500 |
| FVH  | (80°-90°)   | 189.7   | 0.8       |                         |      | G2/225  |
| BL   | (0°-30°)    | 1412.0  | 6.1       | B3/2500                 |      |         |
| BM   | (30°-60°)   | 3062.7  | 13.2      | B3/5000                 |      |         |
| BH   | (60°-80°)   | 1194.8  | 5.1       | B3/2500                 |      | G3/2500 |
| BVH  | (80°-90°)   | 201.4   | 0.9       |                         |      | G2/225  |
| UL   | (90°-100°)  | 0.0     | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0     | 0.0       |                         | U0/0 |         |

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





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°     | 55°     | 65°     | 75°     | 79°     | 85°     |
|-------|--------|--------|--------|--------|--------|---------|---------|---------|---------|---------|---------|
| 0°    | 3418.9 | 3418.9 | 3418.9 | 3418.9 | 3418.9 | 3418.9  | 3418.9  | 3418.9  | 3418.9  | 3418.9  | 3418.9  |
| 2.5°  | 3424.1 | 3424.1 | 3403.3 | 3424.1 | 3413.7 | 3429.2  | 3439.6  | 3439.6  | 3460.4  | 3455.2  | 3455.2  |
| 5°    | 3367.0 | 3356.6 | 3351.4 | 3387.7 | 3408.5 | 3450.0  | 3496.7  | 3517.4  | 3553.8  | 3553.8  | 3558.9  |
| 7.5°  | 3216.5 | 3211.4 | 3237.3 | 3309.9 | 3377.4 | 3481.1  | 3579.7  | 3636.8  | 3693.8  | 3704.2  | 3704.2  |
| 10°   | 3123.2 | 3118.0 | 3149.1 | 3237.3 | 3346.2 | 3496.7  | 3652.3  | 3771.7  | 3865.0  | 3891.0  | 3891.0  |
| 12.5° | 3123.2 | 3123.2 | 3149.1 | 3237.3 | 3351.4 | 3533.0  | 3745.7  | 3948.0  | 4093.3  | 4124.4  | 4114.1  |
| 15°   | 3211.4 | 3206.2 | 3237.3 | 3330.7 | 3439.6 | 3610.8  | 3870.2  | 4140.0  | 4337.1  | 4394.2  | 4399.4  |
| 17.5° | 3304.7 | 3299.6 | 3346.2 | 3465.6 | 3595.3 | 3766.5  | 4031.1  | 4363.1  | 4643.2  | 4715.9  | 4731.4  |
| 20°   | 3450.0 | 3444.8 | 3501.9 | 3616.0 | 3776.8 | 3974.0  | 4248.9  | 4627.7  | 5016.8  | 5094.6  | 5115.3  |
| 22.5° | 3616.0 | 3621.2 | 3683.5 | 3823.5 | 3984.4 | 4243.8  | 4581.0  | 5001.2  | 5468.1  | 5587.4  | 5608.2  |
| 25°   | 3963.6 | 3948.0 | 3999.9 | 4098.5 | 4269.7 | 4581.0  | 4996.0  | 5452.6  | 6007.7  | 6152.9  | 6178.9  |
| 27.5° | 4425.3 | 4399.4 | 4456.5 | 4555.0 | 4679.6 | 4970.1  | 5447.4  | 5955.8  | 6625.0  | 6806.6  | 6811.8  |
| 30°   | 4840.4 | 4824.8 | 4902.6 | 5105.0 | 5234.7 | 5457.7  | 5966.2  | 6547.2  | 7387.7  | 7652.3  | 7662.6  |
| 32.5° | 5198.3 | 5193.2 | 5338.4 | 5597.8 | 5893.5 | 6132.2  | 6625.0  | 7294.3  | 8352.6  | 8658.7  | 8591.3  |
| 35°   | 5540.8 | 5556.3 | 5737.9 | 6007.7 | 6402.0 | 6879.3  | 7377.3  | 8139.9  | 9369.5  | 9737.8  | 9628.9  |
| 37.5° | 5888.3 | 5898.7 | 6137.4 | 6485.0 | 6900.0 | 7522.6  | 8191.8  | 9058.2  | 10251.4 | 10708.0 | 10469.3 |
| 40°   | 6210.0 | 6241.1 | 6562.8 | 6936.3 | 7475.9 | 8108.8  | 8855.9  | 9696.3  | 10931.1 | 11382.4 | 11123.0 |
| 42.5° | 6531.7 | 6578.3 | 6925.9 | 7439.6 | 8015.4 | 8674.3  | 9317.6  | 10085.4 | 11366.8 | 11870.1 | 11470.6 |
| 45°   | 6863.7 | 6894.8 | 7325.4 | 7859.8 | 8513.5 | 9120.5  | 9582.2  | 10334.4 | 11667.8 | 12212.5 | 11667.8 |
| 47.5° | 7086.8 | 7149.0 | 7621.1 | 8238.5 | 8892.2 | 9462.9  | 9794.9  | 10438.2 | 11859.7 | 12435.6 | 11740.4 |
| 50°   | 7175.0 | 7263.2 | 7771.6 | 8456.4 | 9203.5 | 9784.5  | 9960.9  | 10495.3 | 12072.4 | 12632.7 | 11724.8 |
| 52.5° | 7159.4 | 7242.4 | 7797.5 | 8555.0 | 9452.5 | 10080.2 | 10121.7 | 10557.5 | 12222.9 | 12700.2 | 11589.9 |
| 53°   | 7076.4 | 7190.5 | 7813.1 | 8560.2 | 9488.8 | 10158.1 | 10194.4 | 10562.7 | 12243.6 | 12793.5 | 11569.2 |
| 55°   | 6791.1 | 6853.3 | 7652.3 | 8555.0 | 9660.0 | 10448.6 | 10396.7 | 10718.4 | 12300.7 | 12731.3 | 11340.9 |
| 57.5° | 6531.7 | 6593.9 | 7289.1 | 8456.4 | 9800.1 | 10858.4 | 10723.5 | 10692.4 | 11989.4 | 12378.5 | 10765.0 |
| 60°   | 6365.6 | 6386.4 | 6972.6 | 8145.1 | 9743.0 | 11143.8 | 10936.2 | 10386.3 | 11221.6 | 11543.2 | 9753.4  |
| 62.5° | 6225.6 | 6220.4 | 6739.2 | 7699.0 | 9525.1 | 11185.3 | 10977.8 | 9628.9  | 10095.8 | 10147.7 | 8404.5  |
| 65°   | 5909.1 | 5872.8 | 6376.0 | 7195.7 | 9073.8 | 10998.5 | 10469.3 | 8482.3  | 8601.7  | 8430.5  | 6749.6  |
| 67.5° | 5281.4 | 5203.5 | 5649.7 | 6427.9 | 8155.5 | 10469.3 | 9499.2  | 7149.0  | 6780.7  | 6438.3  | 5084.2  |
| 70°   | 3782.0 | 3782.0 | 4140.0 | 4918.2 | 6547.2 | 9047.8  | 8155.5  | 5411.1  | 4669.2  | 4363.1  | 3398.1  |
| 72.5° | 1852.1 | 1898.8 | 2272.3 | 2905.3 | 4389.0 | 6568.0  | 6246.3  | 3507.1  | 2832.6  | 2682.2  | 2178.9  |
| 75°   | 788.6  | 793.8  | 970.2  | 1286.6 | 2225.6 | 3885.8  | 3911.7  | 2023.3  | 1815.8  | 1743.2  | 1442.3  |
| 77.5° | 549.9  | 560.3  | 638.1  | 757.4  | 1058.3 | 1784.7  | 2033.7  | 1224.4  | 1219.2  | 1167.3  | 1027.2  |
| 80°   | 420.2  | 430.6  | 482.5  | 565.5  | 710.8  | 913.1   | 1053.2  | 830.1   | 871.6   | 819.7   | 741.9   |
| 82.5° | 316.5  | 326.8  | 363.2  | 425.4  | 508.4  | 612.2   | 591.4   | 612.2   | 643.3   | 612.2   | 534.4   |
| 85°   | 212.7  | 217.9  | 243.8  | 295.7  | 326.8  | 368.3   | 368.3   | 446.2   | 466.9   | 456.5   | 420.2   |
| 87.5° | 108.9  | 108.9  | 129.7  | 155.6  | 166.0  | 171.2   | 150.5   | 197.1   | 223.1   | 243.8   | 197.1   |
| 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: P1434756

CATALOG NUMBER: GALN-SB4B-750-U-T3LG

**CANDELA DISTRIBUTION (continued):**

|       | 90°     | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 3418.9  | 3418.9 | 3418.9 | 3418.9 | 3418.9 | 3418.9 | 3418.9 | 3418.9 | 3418.9 | 3418.9 | 3418.9 |
| 2.5°  | 3455.2  | 3460.4 | 3444.8 | 3439.6 | 3434.4 | 3408.5 | 3408.5 | 3382.6 | 3377.4 | 3382.6 | 3367.0 |
| 5°    | 3569.3  | 3558.9 | 3517.4 | 3486.3 | 3450.0 | 3377.4 | 3335.9 | 3278.8 | 3263.2 | 3247.7 | 3232.1 |
| 7.5°  | 3709.4  | 3693.8 | 3621.2 | 3538.2 | 3439.6 | 3299.6 | 3221.7 | 3128.3 | 3097.2 | 3071.3 | 3060.9 |
| 10°   | 3885.8  | 3854.7 | 3740.5 | 3564.1 | 3382.6 | 3211.4 | 3102.4 | 2988.3 | 2936.4 | 2926.0 | 2900.1 |
| 12.5° | 4114.1  | 4057.0 | 3844.3 | 3569.3 | 3330.7 | 3107.6 | 2988.3 | 2900.1 | 2879.3 | 2874.1 | 2848.2 |
| 15°   | 4368.3  | 4285.3 | 3942.9 | 3574.5 | 3263.2 | 3019.4 | 2946.8 | 2900.1 | 2900.1 | 2894.9 | 2879.3 |
| 17.5° | 4679.6  | 4544.7 | 4036.2 | 3553.8 | 3180.2 | 2993.5 | 2957.1 | 2915.6 | 2905.3 | 2910.5 | 2889.7 |
| 20°   | 5053.1  | 4830.0 | 4134.8 | 3527.8 | 3143.9 | 2998.6 | 2957.1 | 2900.1 | 2874.1 | 2868.9 | 2853.4 |
| 22.5° | 5483.7  | 5156.8 | 4243.8 | 3486.3 | 3143.9 | 2993.5 | 2926.0 | 2848.2 | 2796.3 | 2775.6 | 2754.8 |
| 25°   | 5976.5  | 5535.6 | 4357.9 | 3470.8 | 3154.3 | 2972.7 | 2863.8 | 2739.2 | 2656.2 | 2625.1 | 2609.6 |
| 27.5° | 6573.2  | 5935.0 | 4440.9 | 3486.3 | 3149.1 | 2926.0 | 2754.8 | 2594.0 | 2500.6 | 2448.7 | 2438.3 |
| 30°   | 7232.0  | 6365.6 | 4498.0 | 3512.3 | 3118.0 | 2837.8 | 2625.1 | 2443.5 | 2313.8 | 2251.6 | 2236.0 |
| 32.5° | 8010.2  | 6848.1 | 4555.0 | 3512.3 | 3040.2 | 2713.3 | 2474.7 | 2277.5 | 2142.6 | 2070.0 | 2059.6 |
| 35°   | 8871.4  | 7439.6 | 4606.9 | 3507.1 | 2946.8 | 2578.4 | 2324.2 | 2121.9 | 1981.8 | 1909.2 | 1904.0 |
| 37.5° | 9602.9  | 7885.7 | 4632.9 | 3455.2 | 2817.1 | 2422.8 | 2184.1 | 1981.8 | 1836.5 | 1758.7 | 1753.5 |
| 40°   | 10054.3 | 8072.5 | 4581.0 | 3351.4 | 2661.4 | 2262.0 | 2028.5 | 1841.7 | 1696.5 | 1603.1 | 1582.3 |
| 42.5° | 10225.5 | 7984.3 | 4415.0 | 3180.2 | 2474.7 | 2101.1 | 1898.8 | 1701.7 | 1509.7 | 1431.9 | 1416.3 |
| 45°   | 10168.4 | 7641.9 | 4062.2 | 2936.4 | 2267.1 | 1955.9 | 1784.7 | 1561.6 | 1437.1 | 1369.6 | 1364.4 |
| 47.5° | 9976.5  | 7112.7 | 3621.2 | 2630.3 | 2049.2 | 1826.2 | 1634.2 | 1525.3 | 1411.1 | 1338.5 | 1333.3 |
| 50°   | 9639.3  | 6547.2 | 3092.0 | 2282.7 | 1852.1 | 1691.3 | 1597.9 | 1509.7 | 1416.3 | 1359.2 | 1348.9 |
| 52.5° | 9208.7  | 5909.1 | 2604.4 | 1945.5 | 1680.9 | 1572.0 | 1561.6 | 1499.3 | 1426.7 | 1364.4 | 1338.5 |
| 53°   | 9110.1  | 5743.1 | 2511.0 | 1888.4 | 1655.0 | 1556.4 | 1551.2 | 1499.3 | 1416.3 | 1359.2 | 1338.5 |
| 55°   | 8638.0  | 5229.5 | 2215.3 | 1686.1 | 1525.3 | 1504.5 | 1551.2 | 1494.1 | 1390.4 | 1343.7 | 1328.1 |
| 57.5° | 7880.5  | 4555.0 | 1929.9 | 1499.3 | 1390.4 | 1442.3 | 1535.6 | 1473.4 | 1359.2 | 1276.2 | 1250.3 |
| 60°   | 6967.4  | 3782.0 | 1712.0 | 1374.8 | 1291.8 | 1364.4 | 1473.4 | 1400.8 | 1245.1 | 1203.6 | 1198.4 |
| 62.5° | 5878.0  | 3060.9 | 1546.0 | 1271.1 | 1208.8 | 1281.4 | 1380.0 | 1255.5 | 1141.4 | 1110.2 | 1099.9 |
| 65°   | 4591.4  | 2433.2 | 1416.3 | 1193.2 | 1125.8 | 1182.9 | 1250.3 | 1172.5 | 1099.9 | 1073.9 | 1068.7 |
| 67.5° | 3413.7  | 1909.2 | 1312.6 | 1125.8 | 1042.8 | 1079.1 | 1156.9 | 1136.2 | 1073.9 | 1058.3 | 1053.2 |
| 70°   | 2355.3  | 1551.2 | 1219.2 | 1063.5 | 939.0  | 980.5  | 1099.9 | 1115.4 | 1053.2 | 1042.8 | 1037.6 |
| 72.5° | 1649.8  | 1312.6 | 1120.6 | 996.1  | 856.0  | 897.5  | 1073.9 | 1073.9 | 1006.5 | 1022.0 | 1011.7 |
| 75°   | 1239.9  | 1105.0 | 1006.5 | 913.1  | 752.3  | 814.5  | 1037.6 | 1027.2 | 959.8  | 1027.2 | 1001.3 |
| 77.5° | 933.8   | 892.3  | 871.6  | 809.3  | 658.9  | 721.1  | 965.0  | 944.2  | 856.0  | 861.2  | 814.5  |
| 80°   | 679.6   | 690.0  | 747.1  | 690.0  | 549.9  | 596.6  | 814.5  | 804.1  | 695.2  | 715.9  | 658.9  |
| 82.5° | 487.7   | 513.6  | 638.1  | 555.1  | 399.5  | 425.4  | 560.3  | 607.0  | 544.7  | 513.6  | 524.0  |
| 85°   | 368.3   | 383.9  | 513.6  | 409.8  | 249.0  | 280.2  | 383.9  | 435.8  | 425.4  | 394.3  | 399.5  |
| 87.5° | 155.6   | 176.4  | 238.6  | 192.0  | 145.3  | 145.3  | 238.6  | 306.1  | 275.0  | 233.5  | 243.8  |
| 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: SP1-2407-184-6

Test Date: 10/10/2024

Luminaire Tested: GSS-SB1A-750-U-5WQ

Data in this report applies to families of products including GSS-SB1A-750-U-5WQ

**Test Information**

Test Method: LM-79-2019  
 Report Number: SP1-2407-184-6  
 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-750-U-5WQ**  
 Description: GALLEON II SITE SLIM 1SQ 350MA 5WQ HIGH DENSITY LIGHTSQUARE WITH 70 CRI 5000K CCT 26 LEDS

**Spectral Parameters**

CCT (K): 4896  
 CIE u': 0.2101  
 CIE v': 0.4901  
 Duv: 0.0035  
 CIE x: 0.3489  
 CIE y: 0.3618  
 CIE z: 0.2893  
 Peak Wavelength (nm): 443  
 Dominant Wavelength (nm): 570  
 Purity: 13.25435  
 Rf: 70.7  
 Rg: 96.8

|           |      |      |       |
|-----------|------|------|-------|
| CRI (Ra): | 70.2 |      |       |
| R1:       | 68.1 | R9:  | -35.1 |
| R2:       | 73.9 | R10: | 39.3  |
| R3:       | 79.4 | R11: | 71.1  |
| R4:       | 72.1 | R12: | 43.8  |
| R5:       | 69.2 | R13: | 68.1  |
| R6:       | 65.7 | R14: | 88.4  |
| R7:       | 78.1 | R15: | 59.7  |
| R8:       | 55.3 |      |       |



**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 5000K 4-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    | 118                      | NR            | 620    | 401                      | NR            | 750    | 12                       | NR            | 880    | 0                        | NR            |
| 365    | 0                        | NR            | 495    | 168                      | NR            | 625    | 365                      | NR            | 755    | 10                       | NR            | 885    | 0                        | NR            |
| 370    | 0                        | NR            | 500    | 230                      | NR            | 630    | 331                      | NR            | 760    | 9                        | NR            | 890    | 0                        | NR            |
| 375    | 0                        | NR            | 505    | 299                      | NR            | 635    | 298                      | NR            | 765    | 8                        | NR            | 895    | 0                        | NR            |
| 380    | 0                        | NR            | 510    | 362                      | NR            | 640    | 266                      | NR            | 770    | 6                        | NR            | 900    | 0                        | NR            |
| 385    | 2                        | NR            | 515    | 418                      | NR            | 645    | 236                      | NR            | 775    | 6                        | NR            | 905    | 0                        | NR            |
| 390    | 4                        | NR            | 520    | 461                      | NR            | 650    | 209                      | NR            | 780    | 5                        | NR            | 910    | 0                        | NR            |
| 395    | 6                        | NR            | 525    | 491                      | NR            | 655    | 184                      | NR            | 785    | 4                        | NR            | 915    | 0                        | NR            |
| 400    | 9                        | NR            | 530    | 514                      | NR            | 660    | 160                      | NR            | 790    | 4                        | NR            | 920    | 0                        | NR            |
| 405    | 14                       | NR            | 535    | 530                      | NR            | 665    | 140                      | NR            | 795    | 3                        | NR            | 925    | 0                        | NR            |
| 410    | 27                       | NR            | 540    | 539                      | NR            | 670    | 122                      | NR            | 800    | 3                        | NR            | 930    | 0                        | NR            |
| 415    | 55                       | NR            | 545    | 549                      | NR            | 675    | 106                      | NR            | 805    | 2                        | NR            | 935    | 0                        | NR            |
| 420    | 115                      | NR            | 550    | 557                      | NR            | 680    | 92                       | NR            | 810    | 2                        | NR            | 940    | 0                        | NR            |
| 425    | 226                      | NR            | 555    | 565                      | NR            | 685    | 79                       | NR            | 815    | 2                        | NR            | 945    | 0                        | NR            |
| 430    | 395                      | NR            | 560    | 572                      | NR            | 690    | 68                       | NR            | 820    | 2                        | NR            | 950    | 0                        | NR            |
| 435    | 648                      | NR            | 565    | 580                      | NR            | 695    | 59                       | NR            | 825    | 1                        | NR            | 955    | 0                        | NR            |
| 440    | 937                      | NR            | 570    | 586                      | NR            | 700    | 51                       | NR            | 830    | 1                        | NR            | 960    | 0                        | NR            |
| 445    | 953                      | NR            | 575    | 588                      | NR            | 705    | 44                       | NR            | 835    | 1                        | NR            | 965    | 0                        | NR            |
| 450    | 591                      | NR            | 580    | 588                      | NR            | 710    | 38                       | NR            | 840    | 1                        | NR            | 970    | 0                        | NR            |
| 455    | 334                      | NR            | 585    | 580                      | NR            | 715    | 32                       | NR            | 845    | 1                        | NR            | 975    | 0                        | NR            |
| 460    | 221                      | NR            | 590    | 568                      | NR            | 720    | 28                       | NR            | 850    | 1                        | NR            | 980    | 0                        | NR            |
| 465    | 140                      | NR            | 595    | 550                      | NR            | 725    | 24                       | NR            | 855    | 1                        | NR            | 985    | 0                        | NR            |
| 470    | 93                       | NR            | 600    | 527                      | NR            | 730    | 21                       | NR            | 860    | 1                        | NR            | 990    | 0                        | NR            |
| 475    | 79                       | NR            | 605    | 499                      | NR            | 735    | 18                       | NR            | 865    | 0                        | NR            | 995    | 0                        | NR            |
| 480    | 76                       | NR            | 610    | 469                      | NR            | 740    | 15                       | NR            | 870    | 0                        | NR            | 1000   | 0                        | NR            |
| 485    | 87                       | NR            | 615    | 435                      | NR            | 745    | 13                       | NR            | 875    | 0                        | NR            |        |                          |               |

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**Scotopic Flux vs. Wavelength**



**Scotopic Lumens: NR**

**S/P: 1.7**

| $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>$(\phi/\text{nm})$ | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>$(\phi/\text{nm})$ | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>$(\phi/\text{nm})$ | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>$(\phi/\text{nm})$ | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>$(\phi/\text{nm})$ |
|-------------------|--------------------------------------|------------------------------|-------------------|--------------------------------------|------------------------------|-------------------|--------------------------------------|------------------------------|-------------------|--------------------------------------|------------------------------|-------------------|--------------------------------------|------------------------------|
| 360               | 0                                    | NR                           | 490               | 118                                  | NR                           | 620               | 401                                  | NR                           | 750               | 12                                   | NR                           | 880               | 0                                    | NR                           |
| 365               | 0                                    | NR                           | 495               | 168                                  | NR                           | 625               | 365                                  | NR                           | 755               | 10                                   | NR                           | 885               | 0                                    | NR                           |
| 370               | 0                                    | NR                           | 500               | 230                                  | NR                           | 630               | 331                                  | NR                           | 760               | 9                                    | NR                           | 890               | 0                                    | NR                           |
| 375               | 0                                    | NR                           | 505               | 299                                  | NR                           | 635               | 298                                  | NR                           | 765               | 8                                    | NR                           | 895               | 0                                    | NR                           |
| 380               | 0                                    | NR                           | 510               | 362                                  | NR                           | 640               | 266                                  | NR                           | 770               | 6                                    | NR                           | 900               | 0                                    | NR                           |
| 385               | 2                                    | NR                           | 515               | 418                                  | NR                           | 645               | 236                                  | NR                           | 775               | 6                                    | NR                           | 905               | 0                                    | NR                           |
| 390               | 4                                    | NR                           | 520               | 461                                  | NR                           | 650               | 209                                  | NR                           | 780               | 5                                    | NR                           | 910               | 0                                    | NR                           |
| 395               | 6                                    | NR                           | 525               | 491                                  | NR                           | 655               | 184                                  | NR                           | 785               | 4                                    | NR                           | 915               | 0                                    | NR                           |
| 400               | 9                                    | NR                           | 530               | 514                                  | NR                           | 660               | 160                                  | NR                           | 790               | 4                                    | NR                           | 920               | 0                                    | NR                           |
| 405               | 14                                   | NR                           | 535               | 530                                  | NR                           | 665               | 140                                  | NR                           | 795               | 3                                    | NR                           | 925               | 0                                    | NR                           |
| 410               | 27                                   | NR                           | 540               | 539                                  | NR                           | 670               | 122                                  | NR                           | 800               | 3                                    | NR                           | 930               | 0                                    | NR                           |
| 415               | 55                                   | NR                           | 545               | 549                                  | NR                           | 675               | 106                                  | NR                           | 805               | 2                                    | NR                           | 935               | 0                                    | NR                           |
| 420               | 115                                  | NR                           | 550               | 557                                  | NR                           | 680               | 92                                   | NR                           | 810               | 2                                    | NR                           | 940               | 0                                    | NR                           |
| 425               | 226                                  | NR                           | 555               | 565                                  | NR                           | 685               | 79                                   | NR                           | 815               | 2                                    | NR                           | 945               | 0                                    | NR                           |
| 430               | 395                                  | NR                           | 560               | 572                                  | NR                           | 690               | 68                                   | NR                           | 820               | 2                                    | NR                           | 950               | 0                                    | NR                           |
| 435               | 648                                  | NR                           | 565               | 580                                  | NR                           | 695               | 59                                   | NR                           | 825               | 1                                    | NR                           | 955               | 0                                    | NR                           |
| 440               | 937                                  | NR                           | 570               | 586                                  | NR                           | 700               | 51                                   | NR                           | 830               | 1                                    | NR                           | 960               | 0                                    | NR                           |
| 445               | 953                                  | NR                           | 575               | 588                                  | NR                           | 705               | 44                                   | NR                           | 835               | 1                                    | NR                           | 965               | 0                                    | NR                           |
| 450               | 591                                  | NR                           | 580               | 588                                  | NR                           | 710               | 38                                   | NR                           | 840               | 1                                    | NR                           | 970               | 0                                    | NR                           |
| 455               | 334                                  | NR                           | 585               | 580                                  | NR                           | 715               | 32                                   | NR                           | 845               | 1                                    | NR                           | 975               | 0                                    | NR                           |
| 460               | 221                                  | NR                           | 590               | 568                                  | NR                           | 720               | 28                                   | NR                           | 850               | 1                                    | NR                           | 980               | 0                                    | NR                           |
| 465               | 140                                  | NR                           | 595               | 550                                  | NR                           | 725               | 24                                   | NR                           | 855               | 1                                    | NR                           | 985               | 0                                    | NR                           |
| 470               | 93                                   | NR                           | 600               | 527                                  | NR                           | 730               | 21                                   | NR                           | 860               | 1                                    | NR                           | 990               | 0                                    | NR                           |
| 475               | 79                                   | NR                           | 605               | 499                                  | NR                           | 735               | 18                                   | NR                           | 865               | 0                                    | NR                           | 995               | 0                                    | NR                           |
| 480               | 76                                   | NR                           | 610               | 469                                  | NR                           | 740               | 15                                   | NR                           | 870               | 0                                    | NR                           | 1000              | 0                                    | NR                           |
| 485               | 87                                   | NR                           | 615               | 435                                  | NR                           | 745               | 13                                   | NR                           | 875               | 0                                    | NR                           |                   |                                      |                              |

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Melanopic Flux vs. Wavelength



Melanopic Lumens: NR

M/P: 3.37

| 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    | 118                      | NR            | 620    | 401                      | NR            | 750    | 12                       | NR            | 880    | 0                        | NR            |
| 365    | 0                        | NR            | 495    | 168                      | NR            | 625    | 365                      | NR            | 755    | 10                       | NR            | 885    | 0                        | NR            |
| 370    | 0                        | NR            | 500    | 230                      | NR            | 630    | 331                      | NR            | 760    | 9                        | NR            | 890    | 0                        | NR            |
| 375    | 0                        | NR            | 505    | 299                      | NR            | 635    | 298                      | NR            | 765    | 8                        | NR            | 895    | 0                        | NR            |
| 380    | 0                        | NR            | 510    | 362                      | NR            | 640    | 266                      | NR            | 770    | 6                        | NR            | 900    | 0                        | NR            |
| 385    | 2                        | NR            | 515    | 418                      | NR            | 645    | 236                      | NR            | 775    | 6                        | NR            | 905    | 0                        | NR            |
| 390    | 4                        | NR            | 520    | 461                      | NR            | 650    | 209                      | NR            | 780    | 5                        | NR            | 910    | 0                        | NR            |
| 395    | 6                        | NR            | 525    | 491                      | NR            | 655    | 184                      | NR            | 785    | 4                        | NR            | 915    | 0                        | NR            |
| 400    | 9                        | NR            | 530    | 514                      | NR            | 660    | 160                      | NR            | 790    | 4                        | NR            | 920    | 0                        | NR            |
| 405    | 14                       | NR            | 535    | 530                      | NR            | 665    | 140                      | NR            | 795    | 3                        | NR            | 925    | 0                        | NR            |
| 410    | 27                       | NR            | 540    | 539                      | NR            | 670    | 122                      | NR            | 800    | 3                        | NR            | 930    | 0                        | NR            |
| 415    | 55                       | NR            | 545    | 549                      | NR            | 675    | 106                      | NR            | 805    | 2                        | NR            | 935    | 0                        | NR            |
| 420    | 115                      | NR            | 550    | 557                      | NR            | 680    | 92                       | NR            | 810    | 2                        | NR            | 940    | 0                        | NR            |
| 425    | 226                      | NR            | 555    | 565                      | NR            | 685    | 79                       | NR            | 815    | 2                        | NR            | 945    | 0                        | NR            |
| 430    | 395                      | NR            | 560    | 572                      | NR            | 690    | 68                       | NR            | 820    | 2                        | NR            | 950    | 0                        | NR            |
| 435    | 648                      | NR            | 565    | 580                      | NR            | 695    | 59                       | NR            | 825    | 1                        | NR            | 955    | 0                        | NR            |
| 440    | 937                      | NR            | 570    | 586                      | NR            | 700    | 51                       | NR            | 830    | 1                        | NR            | 960    | 0                        | NR            |
| 445    | 953                      | NR            | 575    | 588                      | NR            | 705    | 44                       | NR            | 835    | 1                        | NR            | 965    | 0                        | NR            |
| 450    | 591                      | NR            | 580    | 588                      | NR            | 710    | 38                       | NR            | 840    | 1                        | NR            | 970    | 0                        | NR            |
| 455    | 334                      | NR            | 585    | 580                      | NR            | 715    | 32                       | NR            | 845    | 1                        | NR            | 975    | 0                        | NR            |
| 460    | 221                      | NR            | 590    | 568                      | NR            | 720    | 28                       | NR            | 850    | 1                        | NR            | 980    | 0                        | NR            |
| 465    | 140                      | NR            | 595    | 550                      | NR            | 725    | 24                       | NR            | 855    | 1                        | NR            | 985    | 0                        | NR            |
| 470    | 93                       | NR            | 600    | 527                      | NR            | 730    | 21                       | NR            | 860    | 1                        | NR            | 990    | 0                        | NR            |
| 475    | 79                       | NR            | 605    | 499                      | NR            | 735    | 18                       | NR            | 865    | 0                        | NR            | 995    | 0                        | NR            |
| 480    | 76                       | NR            | 610    | 469                      | NR            | 740    | 15                       | NR            | 870    | 0                        | NR            | 1000   | 0                        | NR            |
| 485    | 87                       | NR            | 615    | 435                      | NR            | 745    | 13                       | NR            | 875    | 0                        | NR            |        |                          |               |

**Summary**

$R_f = 70.7$   
 $R_g = 96.8$   
 $CIE R_a = 70.2$   
 $R_g = -35.1$



**Color Vector Graphics**



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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 53 | CES51 = 87 | CES76 = 42 |
| CES02 = 59 | CES27 = 78 | CES52 = 88 | CES77 = 64 |
| CES03 = 30 | CES28 = 76 | CES53 = 74 | CES78 = 45 |
| CES04 = 69 | CES29 = 48 | CES54 = 80 | CES79 = 74 |
| CES05 = 46 | CES30 = 56 | CES55 = 79 | CES80 = 71 |
| CES06 = 50 | CES31 = 54 | CES56 = 68 | CES81 = 72 |
| CES07 = 39 | CES32 = 50 | CES57 = 65 | CES82 = 88 |
| CES08 = 38 | CES33 = 60 | CES58 = 67 | CES83 = 82 |
| CES09 = 29 | CES34 = 62 | CES59 = 87 | CES84 = 87 |
| CES10 = 72 | CES35 = 79 | CES60 = 91 | CES85 = 84 |
| CES11 = 56 | CES36 = 90 | CES61 = 87 | CES86 = 74 |
| CES12 = 61 | CES37 = 72 | CES62 = 79 | CES87 = 75 |
| CES13 = 41 | CES38 = 66 | CES63 = 72 | CES88 = 76 |
| CES14 = 74 | CES39 = 91 | CES64 = 70 | CES89 = 74 |
| CES15 = 70 | CES40 = 83 | CES65 = 63 | CES90 = 73 |
| CES16 = 46 | CES41 = 83 | CES66 = 64 | CES91 = 92 |
| CES17 = 49 | CES42 = 70 | CES67 = 62 | CES92 = 67 |
| CES18 = 55 | CES43 = 68 | CES68 = 69 | CES93 = 81 |
| CES19 = 71 | CES44 = 98 | CES69 = 80 | CES94 = 56 |
| CES20 = 64 | CES45 = 78 | CES70 = 56 | CES95 = 71 |
| CES21 = 85 | CES46 = 77 | CES71 = 53 | CES96 = 77 |
| CES22 = 77 | CES47 = 73 | CES72 = 84 | CES97 = 82 |
| CES23 = 91 | CES48 = 65 | CES73 = 46 | CES98 = 71 |
| CES24 = 90 | CES49 = 76 | CES74 = 94 | CES99 = 59 |
| CES25 = 71 | CES50 = 85 | CES75 = 49 |            |



Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)