

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: P1435533

Luminaire Tested: **GALN-SB9C-840-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: P1435533  
 Test Lab: INNOVATION CENTER(G1)  
 Issue Date: 03/24/202  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: McGRAW-EDISON  
 Catalog Number: GALN-SB9C-840-U-T4LG  
 Description: GALLEON II AREA AND ROADWAY HIGH DENSITY LUMINAIRE 615mA 9xLight Square PACKAGE 80CRI 4000K FIXTURE w/ TYPE IV LOW GLARE  
 Light Source: (234) 4000K 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               |

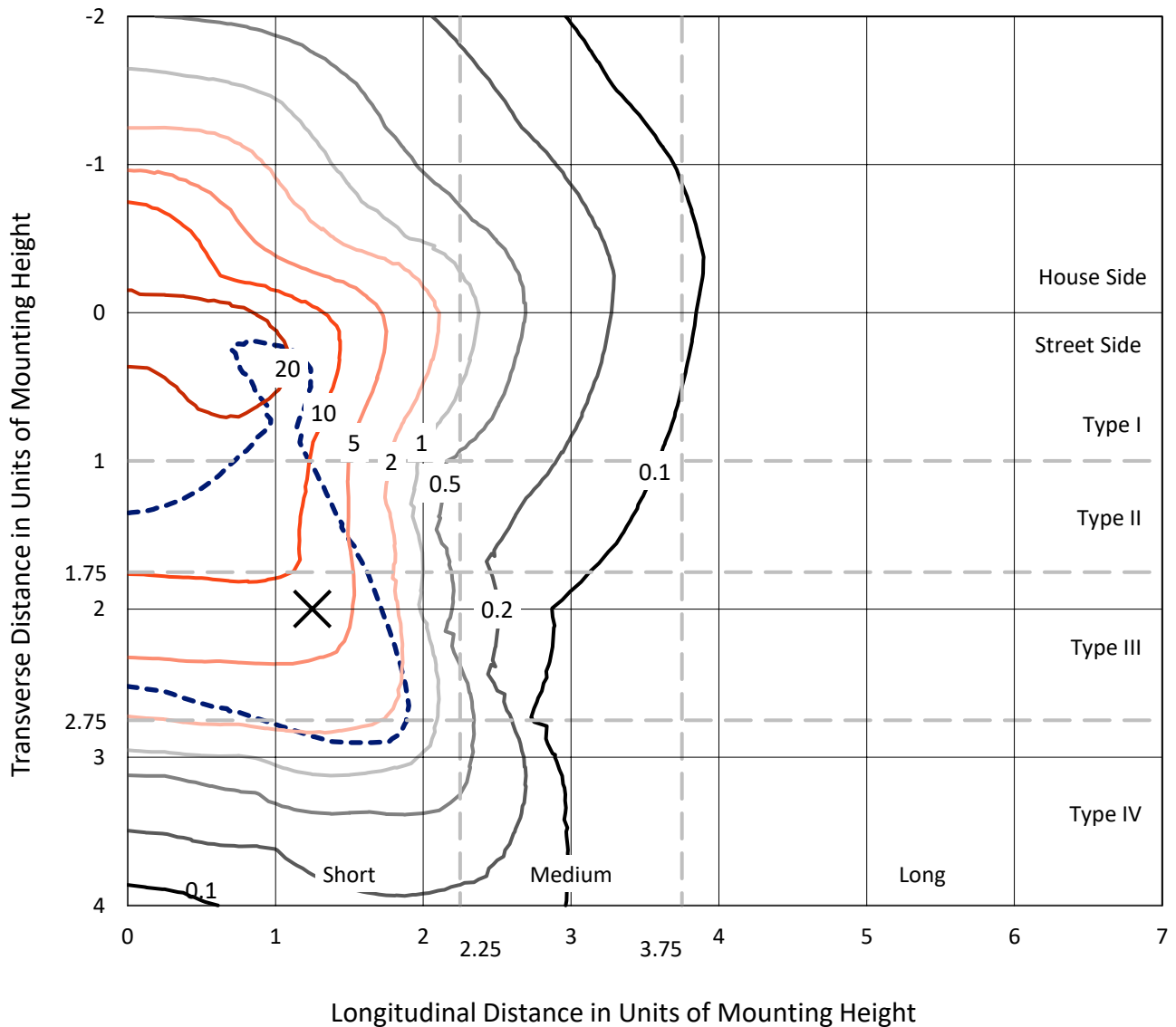
**Summary**

Lumens per Lamp: N/A  
 Luminaire Lumens: 63847.5 lumens  
 Efficiency: N/A  
 Efficacy: 141.9 lumens/watt  
 Luminous Opening: Rectangular (W 1.5' x L: 1.5' x H: 0')  
 IES Classification: Type IV - Short  
 BUG Rating: B4 - U0 - G5  
  
 Input Watts (W): 449.8  
 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: P1435533  
 CATALOG NUMBER: GALN-SB9C-840-U-T4LG

### Iso-Footcandle Lines of Horizontal Illumination

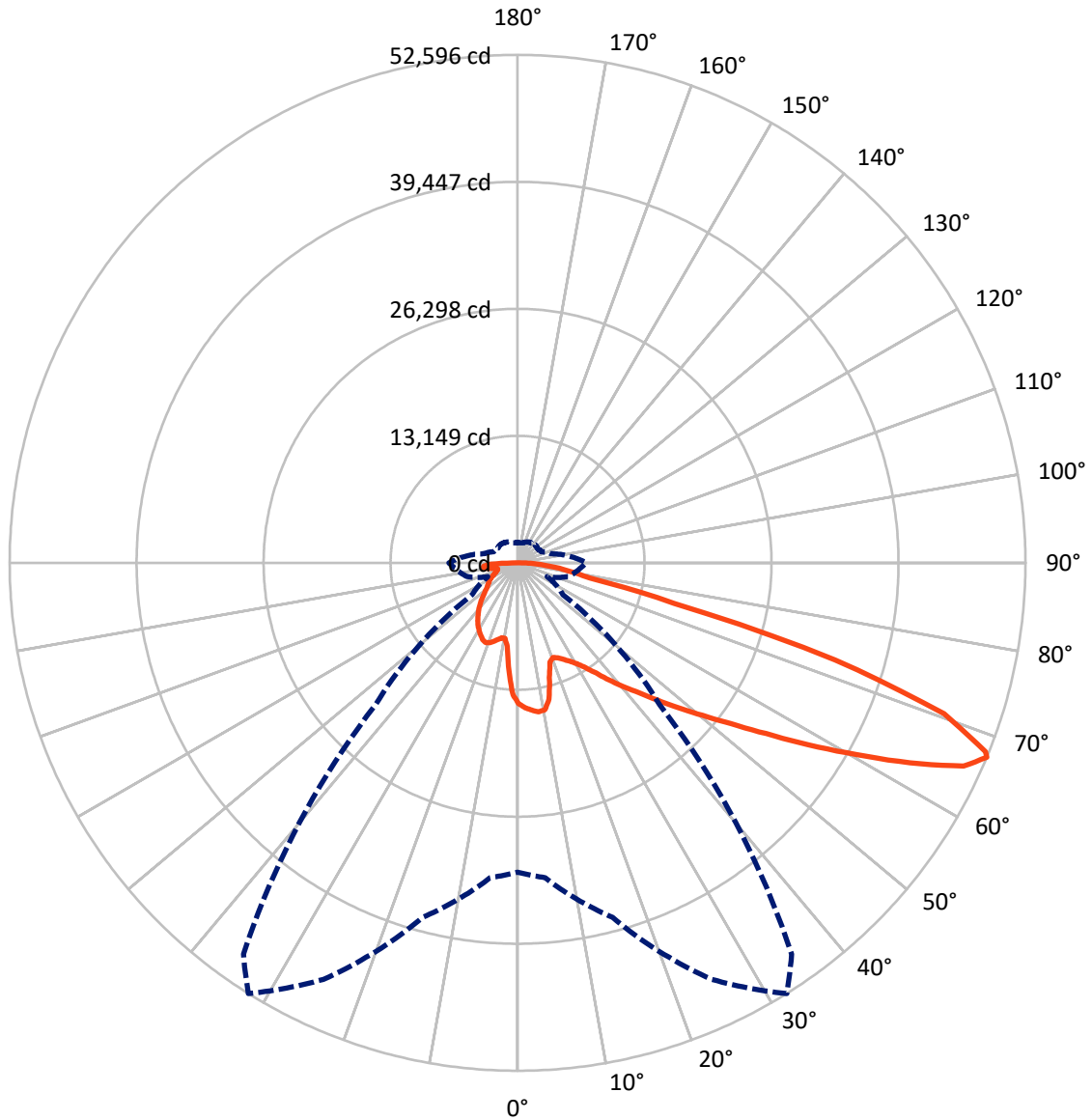
✕ Max cd  
 - - - 1/2 Max cd



Based on 20 foot mounting height. Maximum calculated value = 39.4 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    | 15115.7  | 0.0    | 15115.7 |
|                    | % Fixture | 23.7     | 0.0    | 23.7    |
| <b>Street Side</b> | Lumens    | 48731.8  | 0.0    | 48731.8 |
|                    | % Fixture | 76.3     | 0.0    | 76.3    |
| <b>Total</b>       | Lumens    | 63847.5  | 0.0    | 63847.5 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**Coefficient of Utilization**

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 1274.6  | 2.0       |
| 10°-20°   | 3384.2  | 5.3       |
| 20°-30°   | 5526.6  | 8.7       |
| 30°-40°   | 8145.7  | 12.8      |
| 40°-50°   | 11233.4 | 17.6      |
| 50°-60°   | 14191.1 | 22.2      |
| 60°-70°   | 13734.5 | 21.5      |
| 70°-80°   | 4901.7  | 7.7       |
| 80°-90°   | 1455.6  | 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°    | 63847.5 | 100.0     |
| 0°-180°   | 63847.5 | 100.0     |

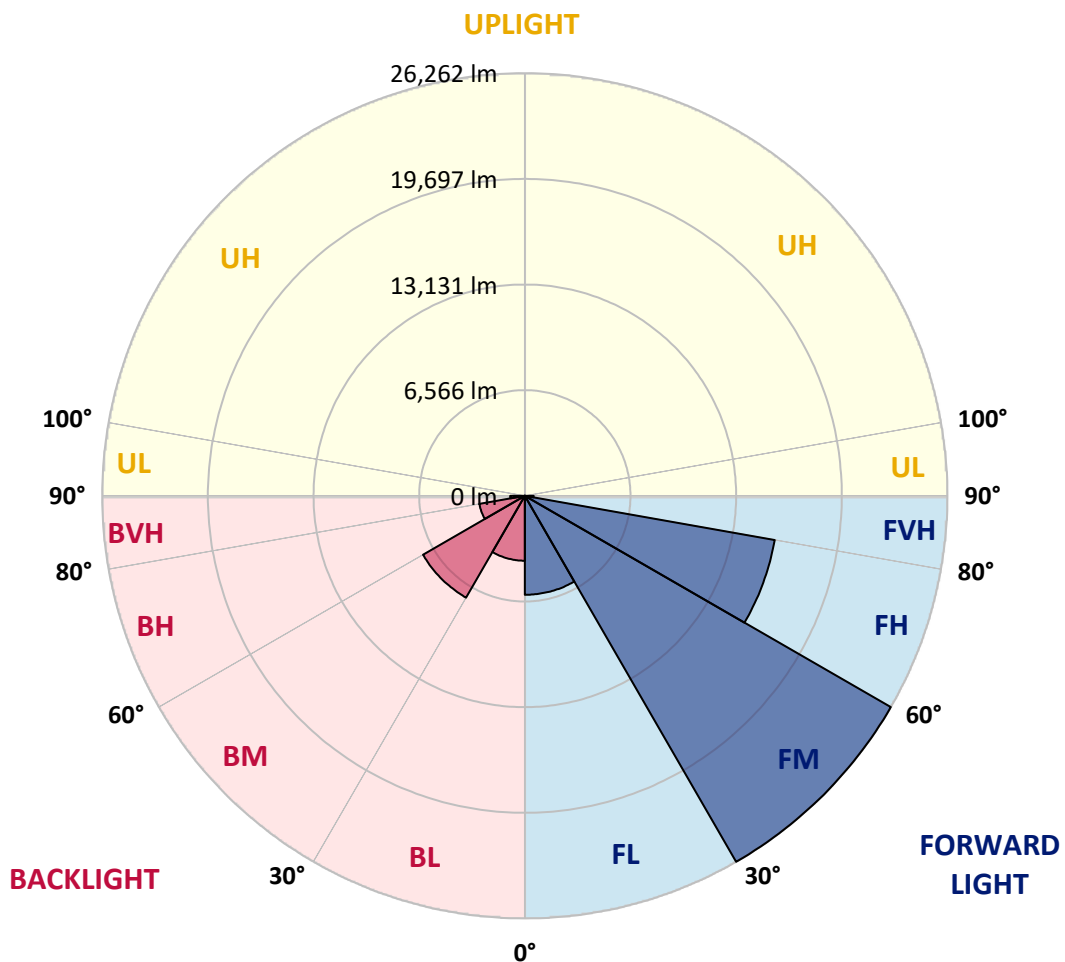


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**LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:**

| Zone           | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |         |
|----------------|---------|-----------|-------------------------|------|---------|
|                |         |           | B                       | U    | G       |
| FL (0°-30°)    | 6151.8  | 9.6       |                         |      |         |
| FM (30°-60°)   | 26262.5 | 41.1      |                         |      |         |
| FH (60°-80°)   | 15769.0 | 24.7      |                         |      | G5      |
| FVH (80°-90°)  | 548.5   | 0.9       |                         |      | G4/750  |
| BL (0°-30°)    | 4033.6  | 6.3       | B4/5000                 |      |         |
| BM (30°-60°)   | 7307.7  | 11.4      | B4/8500                 |      |         |
| BH (60°-80°)   | 2867.2  | 4.5       | B4/5000                 |      | G4/5000 |
| BVH (80°-90°)  | 907.1   | 1.4       |                         |      | G5      |
| UL (90°-100°)  | 0.0     | 0.0       |                         | U0/0 |         |
| UH (100°-180°) | 0.0     | 0.0       |                         | U0/0 |         |

**BUG Rating: B4-U0-G5**  
 Type IV Short





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 32°     | 35°     | 45°     | 55°     | 65°     | 75°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 14587.9 | 14587.9 | 14587.9 | 14587.9 | 14587.9 | 14587.9 | 14587.9 | 14587.9 | 14587.9 | 14587.9 | 14587.9 |
| 2.5°  | 15140.8 | 15098.2 | 15055.7 | 15084.1 | 15027.4 | 15013.2 | 14942.3 | 14913.9 | 14828.9 | 14814.7 | 14658.8 |
| 5°    | 15452.7 | 15367.6 | 15353.4 | 15381.8 | 15325.1 | 15325.1 | 15268.4 | 15225.8 | 15098.2 | 15027.4 | 14800.5 |
| 7.5°  | 15452.7 | 15438.5 | 15466.8 | 15566.1 | 15580.3 | 15580.3 | 15580.3 | 15594.4 | 15466.8 | 15367.6 | 15013.2 |
| 10°   | 14573.7 | 14431.9 | 14743.8 | 15240.0 | 15481.0 | 15622.8 | 15878.0 | 16033.9 | 15934.7 | 15863.8 | 15381.8 |
| 12.5° | 11951.0 | 11965.2 | 12461.4 | 13524.6 | 14488.6 | 14899.8 | 15963.0 | 16530.1 | 16572.6 | 16459.2 | 15849.6 |
| 15°   | 10136.4 | 10207.3 | 10462.4 | 11228.0 | 12333.8 | 12943.4 | 15466.8 | 16969.6 | 17309.8 | 17196.4 | 16416.7 |
| 17.5° | 9583.5  | 9626.0  | 9739.4  | 10178.9 | 10802.7 | 11298.9 | 14120.0 | 17253.1 | 18203.0 | 18061.2 | 17054.6 |
| 20°   | 9498.4  | 9526.8  | 9668.5  | 10037.1 | 10462.4 | 10746.0 | 12744.9 | 17026.3 | 19039.4 | 18982.7 | 17635.9 |
| 22.5° | 9512.6  | 9541.0  | 9725.3  | 10235.6 | 10675.1 | 10916.1 | 12305.4 | 16501.7 | 19918.3 | 19975.0 | 18231.3 |
| 25°   | 9541.0  | 9555.1  | 9838.7  | 10519.2 | 11072.0 | 11369.8 | 12589.0 | 16033.9 | 20655.5 | 21137.5 | 18883.4 |
| 27.5° | 9696.9  | 9739.4  | 10122.2 | 10887.7 | 11539.9 | 11880.1 | 13255.3 | 16189.9 | 21463.6 | 22456.0 | 19663.2 |
| 30°   | 10122.2 | 10150.6 | 10618.4 | 11412.3 | 12121.1 | 12475.5 | 14049.2 | 16813.6 | 22456.0 | 23817.0 | 20428.7 |
| 32.5° | 10788.5 | 10816.9 | 11355.6 | 12177.8 | 12943.4 | 13368.7 | 15084.1 | 18004.5 | 23561.8 | 25248.8 | 21194.3 |
| 35°   | 11710.0 | 11724.2 | 12333.8 | 13212.7 | 14020.8 | 14502.8 | 16289.1 | 19351.3 | 24710.1 | 26468.0 | 21761.3 |
| 37.5° | 12801.6 | 12900.8 | 13524.6 | 14446.1 | 15396.0 | 15835.4 | 17706.8 | 20924.9 | 25730.8 | 27502.9 | 22087.4 |
| 40°   | 14304.3 | 14332.7 | 14942.3 | 15835.4 | 16842.0 | 17267.3 | 19124.4 | 22413.5 | 26850.8 | 28112.5 | 22385.1 |
| 42.5° | 15849.6 | 16090.6 | 16601.0 | 17593.4 | 18344.7 | 18685.0 | 20740.6 | 23774.4 | 27743.9 | 28140.9 | 22257.5 |
| 45°   | 17919.4 | 18103.7 | 18614.1 | 19493.0 | 20244.4 | 20641.4 | 22484.3 | 25022.0 | 28197.6 | 27899.9 | 21974.0 |
| 47.5° | 20286.9 | 20400.4 | 20811.5 | 21605.4 | 22441.8 | 22725.3 | 24299.0 | 25730.8 | 28367.7 | 27729.7 | 21846.4 |
| 50°   | 23079.8 | 23079.8 | 23377.5 | 24058.0 | 24823.5 | 25220.4 | 25971.8 | 26156.1 | 28863.9 | 27432.0 | 22172.4 |
| 52.5° | 25433.1 | 25546.5 | 25943.5 | 26907.5 | 27673.0 | 28126.7 | 27276.1 | 26808.2 | 27857.3 | 25773.3 | 22271.7 |
| 55°   | 27687.2 | 27814.8 | 28707.9 | 29913.0 | 31217.2 | 31713.4 | 28906.4 | 26482.2 | 24469.1 | 23349.1 | 21591.2 |
| 57.5° | 29842.1 | 30111.4 | 31231.4 | 33584.7 | 35555.3 | 35512.8 | 30976.2 | 23561.8 | 19975.0 | 20669.7 | 20102.6 |
| 60°   | 32847.5 | 33131.1 | 34917.4 | 37880.3 | 40290.3 | 39283.8 | 31004.6 | 19606.5 | 15566.1 | 16501.7 | 17309.8 |
| 62.5° | 35356.8 | 35838.8 | 38461.5 | 43395.1 | 45606.6 | 44033.0 | 28438.6 | 15013.2 | 10334.9 | 11511.5 | 13382.9 |
| 65°   | 35130.0 | 35768.0 | 39836.7 | 47449.6 | 50752.8 | 49292.6 | 24681.7 | 9498.4  | 5330.5  | 7868.1  | 9370.8  |
| 67°   | 32039.5 | 32734.1 | 38007.9 | 47591.4 | 52595.8 | 49476.9 | 20839.8 | 5741.6  | 3388.2  | 5458.1  | 6507.1  |
| 67.5° | 30267.4 | 31288.1 | 37100.6 | 47322.0 | 52255.5 | 48697.2 | 19110.3 | 4805.9  | 3189.8  | 5075.3  | 5925.9  |
| 70°   | 18614.1 | 20258.6 | 27843.1 | 41835.6 | 46840.0 | 40758.2 | 10618.4 | 2721.9  | 2594.3  | 3402.4  | 4097.1  |
| 72.5° | 5599.8  | 6096.0  | 10746.0 | 26836.6 | 34378.6 | 30210.7 | 4777.6  | 2098.2  | 2325.0  | 2736.1  | 3161.4  |
| 75°   | 2721.9  | 2906.2  | 4437.3  | 10972.8 | 16742.7 | 16657.7 | 2665.2  | 1800.4  | 2154.9  | 2296.6  | 2495.1  |
| 77.5° | 1743.7  | 1857.2  | 2764.5  | 6138.5  | 7669.6  | 6833.2  | 1928.0  | 1573.6  | 1913.9  | 1885.5  | 1857.2  |
| 80°   | 1091.6  | 1148.3  | 1772.1  | 3558.4  | 5656.5  | 4720.9  | 1417.7  | 1290.1  | 1644.5  | 1460.2  | 1318.4  |
| 82.5° | 708.8   | 779.7   | 1134.1  | 2169.0  | 4040.4  | 3515.8  | 935.7   | 921.5   | 1361.0  | 1162.5  | 1020.7  |
| 85°   | 467.8   | 524.5   | 723.0   | 1275.9  | 2395.9  | 2509.3  | 609.6   | 638.0   | 1049.1  | 879.0   | 779.7   |
| 87.5° | 170.1   | 212.7   | 368.6   | 567.1   | 1120.0  | 1389.3  | 255.2   | 241.0   | 510.4   | 411.1   | 326.1   |
| 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: P1435533  
 CATALOG NUMBER: GALN-SB9C-840-U-T4LG

**CANDELA DISTRIBUTION (continued):**

|       | 90°     | 95°     | 105°    | 115°    | 125°    | 135°    | 145°    | 155°    | 165°    | 175°    | 180°    |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 14587.9 | 14587.9 | 14587.9 | 14587.9 | 14587.9 | 14587.9 | 14587.9 | 14587.9 | 14587.9 | 14587.9 | 14587.9 |
| 2.5°  | 14630.4 | 14587.9 | 14389.4 | 14219.3 | 14091.7 | 13921.6 | 13737.3 | 13524.6 | 13382.9 | 13411.2 | 13368.7 |
| 5°    | 14701.3 | 14587.9 | 14205.1 | 13623.9 | 13056.8 | 12348.0 | 11440.6 | 10901.9 | 10490.8 | 10278.1 | 10334.9 |
| 7.5°  | 14857.2 | 14658.8 | 13850.7 | 12674.0 | 11199.6 | 9753.6  | 8860.5  | 8350.1  | 8109.1  | 8009.9  | 7995.7  |
| 10°   | 15126.6 | 14786.4 | 13397.0 | 11199.6 | 9271.6  | 8293.4  | 7967.3  | 7825.6  | 7797.2  | 7797.2  | 7783.0  |
| 12.5° | 15452.7 | 14913.9 | 12631.5 | 9767.8  | 8350.1  | 7995.7  | 7939.0  | 7953.2  | 7995.7  | 8038.2  | 7967.3  |
| 15°   | 15849.6 | 14970.7 | 11681.6 | 8903.0  | 8165.8  | 8080.8  | 8165.8  | 8265.0  | 8335.9  | 8392.6  | 8321.8  |
| 17.5° | 16246.6 | 14913.9 | 10788.5 | 8491.9  | 8194.2  | 8307.6  | 8477.7  | 8633.6  | 8676.2  | 8761.2  | 8704.5  |
| 20°   | 16530.1 | 14715.5 | 10023.0 | 8335.9  | 8265.0  | 8520.2  | 8732.9  | 8903.0  | 8988.1  | 9044.8  | 8988.1  |
| 22.5° | 16742.7 | 14460.3 | 9470.1  | 8180.0  | 8265.0  | 8576.9  | 8832.1  | 9030.6  | 9129.8  | 9186.5  | 9115.7  |
| 25°   | 16927.0 | 14105.9 | 9044.8  | 7953.2  | 8094.9  | 8392.6  | 8676.2  | 8874.6  | 9016.4  | 9101.5  | 9058.9  |
| 27.5° | 17153.9 | 13822.3 | 8647.8  | 7612.9  | 7740.5  | 8024.0  | 8321.8  | 8562.8  | 8832.1  | 8973.9  | 8945.5  |
| 30°   | 17409.1 | 13680.6 | 8265.0  | 7244.3  | 7329.4  | 7612.9  | 7967.3  | 8293.4  | 8662.0  | 8846.3  | 8846.3  |
| 32.5° | 17706.8 | 13581.3 | 7910.6  | 6889.9  | 6960.8  | 7272.7  | 7612.9  | 7910.6  | 8307.6  | 8605.3  | 8591.1  |
| 35°   | 17834.4 | 13467.9 | 7627.1  | 6563.8  | 6705.6  | 6960.8  | 7230.1  | 7428.6  | 7839.7  | 8194.2  | 8222.5  |
| 37.5° | 17962.0 | 13425.4 | 7485.3  | 6308.7  | 6422.1  | 6620.5  | 6762.3  | 6861.5  | 7244.3  | 7612.9  | 7627.1  |
| 40°   | 18117.9 | 13623.9 | 7584.6  | 6138.5  | 6039.3  | 6237.8  | 6308.7  | 6365.4  | 6563.8  | 6804.8  | 6804.8  |
| 42.5° | 18018.7 | 13765.6 | 7811.4  | 5982.6  | 5571.5  | 5798.3  | 5826.6  | 5812.5  | 5826.6  | 5840.8  | 5826.6  |
| 45°   | 17763.5 | 13623.9 | 7811.4  | 5741.6  | 5075.3  | 5316.3  | 5302.1  | 5231.2  | 5117.8  | 4820.1  | 4777.6  |
| 47.5° | 17706.8 | 13538.8 | 7513.7  | 5344.6  | 4579.1  | 4777.6  | 4805.9  | 4664.2  | 4338.1  | 4026.2  | 3927.0  |
| 50°   | 17947.8 | 13694.7 | 7045.8  | 4862.6  | 4153.8  | 4323.9  | 4394.8  | 4153.8  | 3785.2  | 3459.1  | 3402.4  |
| 52.5° | 18302.2 | 13893.2 | 6365.4  | 4338.1  | 3799.4  | 3969.5  | 4054.6  | 3785.2  | 3402.4  | 3147.2  | 3118.9  |
| 55°   | 18259.7 | 13893.2 | 5599.8  | 3856.1  | 3530.0  | 3657.6  | 3799.4  | 3515.8  | 3218.1  | 3076.4  | 3062.2  |
| 57.5° | 17338.2 | 13368.7 | 5032.7  | 3515.8  | 3274.8  | 3388.2  | 3572.5  | 3303.2  | 3019.6  | 3048.0  | 3090.5  |
| 60°   | 15537.7 | 12007.7 | 4607.4  | 3289.0  | 3048.0  | 3161.4  | 3359.9  | 3048.0  | 2679.4  | 2580.2  | 2580.2  |
| 62.5° | 12801.6 | 9895.4  | 4267.2  | 3062.2  | 2835.4  | 2977.1  | 3076.4  | 2665.2  | 2424.2  | 2310.8  | 2310.8  |
| 65°   | 9597.7  | 7655.4  | 3912.8  | 2877.9  | 2651.1  | 2807.0  | 2693.6  | 2495.1  | 2254.1  | 2169.0  | 2183.2  |
| 67°   | 7116.7  | 5940.1  | 3615.1  | 2721.9  | 2537.6  | 2608.5  | 2523.5  | 2381.7  | 2140.7  | 2069.8  | 2140.7  |
| 67.5° | 6393.7  | 5642.3  | 3544.2  | 2679.4  | 2509.3  | 2566.0  | 2480.9  | 2367.5  | 2112.3  | 2041.5  | 2112.3  |
| 70°   | 4394.8  | 4338.1  | 3161.4  | 2480.9  | 2353.3  | 2296.6  | 2339.2  | 2197.4  | 1984.7  | 1956.4  | 2027.3  |
| 72.5° | 3345.7  | 3459.1  | 2835.4  | 2310.8  | 2183.2  | 2112.3  | 2211.6  | 2069.8  | 1857.2  | 1899.7  | 1970.6  |
| 75°   | 2622.7  | 2792.8  | 2537.6  | 2069.8  | 1984.7  | 1998.9  | 2197.4  | 2140.7  | 1970.6  | 2013.1  | 2027.3  |
| 77.5° | 1942.2  | 2254.1  | 2169.0  | 1800.4  | 1729.6  | 1928.0  | 2480.9  | 2651.1  | 2353.3  | 2282.5  | 2183.2  |
| 80°   | 1417.7  | 1616.2  | 1828.8  | 1488.6  | 1446.0  | 1857.2  | 3062.2  | 3388.2  | 2906.2  | 2622.7  | 2551.8  |
| 82.5° | 1049.1  | 1134.1  | 1502.7  | 1190.8  | 1049.1  | 1658.7  | 3402.4  | 3983.7  | 3459.1  | 2920.4  | 2835.4  |
| 85°   | 751.4   | 879.0   | 1190.8  | 879.0   | 694.7   | 1361.0  | 3331.5  | 3898.6  | 3430.8  | 2764.5  | 2693.6  |
| 87.5° | 269.4   | 382.8   | 510.4   | 396.9   | 354.4   | 935.7   | 2750.3  | 2807.0  | 2140.7  | 978.2   | 992.4   |
| 90°   | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |

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



LM-79-2019: Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Report Prepared for

Cooper Lighting Solutions

McGraw-Edison

Report Number: SP1-2407-184-11

Test Date: 10/11/2024

Luminaire Tested: GSS-SB1A-840-U-5WQ

Data in this report applies to families of products including GSS-SB1A-840-U-5WQ

**Test Information**

Test Method: LM-79-2019  
 Report Number: SP1-2407-184-11  
 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-840-U-5WQ**  
 Description: GALLEON II SITE SLIM 1SQ 350MA 5WQ HIGH DENSITY LIGHTSQUARE WITH 80 CRI 4000K CCT 26 LEDS

**Spectral Parameters**

CCT (K): 3897  
 CIE u': 0.2249  
 CIE v': 0.5084  
 Duv: 0.0039  
 CIE x: 0.3882  
 CIE y: 0.3900  
 CIE z: 0.2218  
 Peak Wavelength (nm): 445  
 Dominant Wavelength (nm): 577  
 Purity: 33.54925  
 Rf: 81.8  
 Rg: 98.6

|           |      |      |      |
|-----------|------|------|------|
| CRI (Ra): | 80.2 |      |      |
| R1:       | 78.9 | R9:  | 6.7  |
| R2:       | 83.5 | R10: | 61.9 |
| R3:       | 88.3 | R11: | 81.9 |
| R4:       | 82.1 | R12: | 58.9 |
| R5:       | 78.8 | R13: | 79.2 |
| R6:       | 78.4 | R14: | 93.2 |
| R7:       | 85.8 | R15: | 71.9 |
| R8:       | 65.8 |      |      |



**Test Conditions**

Stabilization Time: 24M  
 Operation Time: 1H 24M  
 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 4000K 4-step quadrangle

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**Photopic Flux vs. Wavelength**



**Photopic Lumens: NR**

| $\lambda$<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>( $\phi$ /nm) | $\lambda$<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>( $\phi$ /nm) | $\lambda$<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>( $\phi$ /nm) | $\lambda$<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>( $\phi$ /nm) | $\lambda$<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>( $\phi$ /nm) |
|-------------------|-----------------------------|-------------------------|-------------------|-----------------------------|-------------------------|-------------------|-----------------------------|-------------------------|-------------------|-----------------------------|-------------------------|-------------------|-----------------------------|-------------------------|
| 360               | 0                           | NR                      | 490               | 242                         | NR                      | 620               | 792                         | NR                      | 750               | 29                          | NR                      | 880               | 1                           | NR                      |
| 365               | 0                           | NR                      | 495               | 320                         | NR                      | 625               | 748                         | NR                      | 755               | 25                          | NR                      | 885               | 1                           | NR                      |
| 370               | 0                           | NR                      | 500               | 401                         | NR                      | 630               | 703                         | NR                      | 760               | 22                          | NR                      | 890               | 1                           | NR                      |
| 375               | 0                           | NR                      | 505               | 479                         | NR                      | 635               | 651                         | NR                      | 765               | 19                          | NR                      | 895               | 1                           | NR                      |
| 380               | 0                           | NR                      | 510               | 546                         | NR                      | 640               | 599                         | NR                      | 770               | 16                          | NR                      | 900               | 1                           | NR                      |
| 385               | 0                           | NR                      | 515               | 602                         | NR                      | 645               | 545                         | NR                      | 775               | 14                          | NR                      | 905               | 0                           | NR                      |
| 390               | 2                           | NR                      | 520               | 645                         | NR                      | 650               | 493                         | NR                      | 780               | 12                          | NR                      | 910               | 0                           | NR                      |
| 395               | 4                           | NR                      | 525               | 674                         | NR                      | 655               | 443                         | NR                      | 785               | 10                          | NR                      | 915               | 0                           | NR                      |
| 400               | 6                           | NR                      | 530               | 699                         | NR                      | 660               | 394                         | NR                      | 790               | 9                           | NR                      | 920               | 0                           | NR                      |
| 405               | 11                          | NR                      | 535               | 718                         | NR                      | 665               | 349                         | NR                      | 795               | 8                           | NR                      | 925               | 0                           | NR                      |
| 410               | 22                          | NR                      | 540               | 732                         | NR                      | 670               | 307                         | NR                      | 800               | 7                           | NR                      | 930               | 0                           | NR                      |
| 415               | 43                          | NR                      | 545               | 749                         | NR                      | 675               | 269                         | NR                      | 805               | 6                           | NR                      | 935               | 0                           | NR                      |
| 420               | 86                          | NR                      | 550               | 762                         | NR                      | 680               | 235                         | NR                      | 810               | 5                           | NR                      | 940               | 0                           | NR                      |
| 425               | 164                         | NR                      | 555               | 778                         | NR                      | 685               | 204                         | NR                      | 815               | 5                           | NR                      | 945               | 0                           | NR                      |
| 430               | 288                         | NR                      | 560               | 792                         | NR                      | 690               | 178                         | NR                      | 820               | 4                           | NR                      | 950               | 0                           | NR                      |
| 435               | 478                         | NR                      | 565               | 809                         | NR                      | 695               | 153                         | NR                      | 825               | 3                           | NR                      | 955               | 0                           | NR                      |
| 440               | 766                         | NR                      | 570               | 827                         | NR                      | 700               | 132                         | NR                      | 830               | 3                           | NR                      | 960               | 0                           | NR                      |
| 445               | 1000                        | NR                      | 575               | 845                         | NR                      | 705               | 114                         | NR                      | 835               | 3                           | NR                      | 965               | 0                           | NR                      |
| 450               | 726                         | NR                      | 580               | 862                         | NR                      | 710               | 98                          | NR                      | 840               | 2                           | NR                      | 970               | 0                           | NR                      |
| 455               | 425                         | NR                      | 585               | 875                         | NR                      | 715               | 84                          | NR                      | 845               | 2                           | NR                      | 975               | 0                           | NR                      |
| 460               | 324                         | NR                      | 590               | 887                         | NR                      | 720               | 73                          | NR                      | 850               | 2                           | NR                      | 980               | 0                           | NR                      |
| 465               | 225                         | NR                      | 595               | 890                         | NR                      | 725               | 63                          | NR                      | 855               | 1                           | NR                      | 985               | 0                           | NR                      |
| 470               | 157                         | NR                      | 600               | 887                         | NR                      | 730               | 54                          | NR                      | 860               | 1                           | NR                      | 990               | 0                           | NR                      |
| 475               | 147                         | NR                      | 605               | 875                         | NR                      | 735               | 46                          | NR                      | 865               | 1                           | NR                      | 995               | 0                           | NR                      |
| 480               | 154                         | NR                      | 610               | 856                         | NR                      | 740               | 40                          | NR                      | 870               | 1                           | NR                      | 1000              | 0                           | NR                      |
| 485               | 184                         | NR                      | 615               | 828                         | NR                      | 745               | 34                          | NR                      | 875               | 1                           | NR                      |                   |                             |                         |

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**Scotopic Flux vs. Wavelength**



**Scotopic Lumens: NR**

**S/P: 1.57**

| 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    | 242                      | NR            | 620    | 792                      | NR            | 750    | 29                       | NR            | 880    | 1                        | NR            |
| 365    | 0                        | NR            | 495    | 320                      | NR            | 625    | 748                      | NR            | 755    | 25                       | NR            | 885    | 1                        | NR            |
| 370    | 0                        | NR            | 500    | 401                      | NR            | 630    | 703                      | NR            | 760    | 22                       | NR            | 890    | 1                        | NR            |
| 375    | 0                        | NR            | 505    | 479                      | NR            | 635    | 651                      | NR            | 765    | 19                       | NR            | 895    | 1                        | NR            |
| 380    | 0                        | NR            | 510    | 546                      | NR            | 640    | 599                      | NR            | 770    | 16                       | NR            | 900    | 1                        | NR            |
| 385    | 0                        | NR            | 515    | 602                      | NR            | 645    | 545                      | NR            | 775    | 14                       | NR            | 905    | 0                        | NR            |
| 390    | 2                        | NR            | 520    | 645                      | NR            | 650    | 493                      | NR            | 780    | 12                       | NR            | 910    | 0                        | NR            |
| 395    | 4                        | NR            | 525    | 674                      | NR            | 655    | 443                      | NR            | 785    | 10                       | NR            | 915    | 0                        | NR            |
| 400    | 6                        | NR            | 530    | 699                      | NR            | 660    | 394                      | NR            | 790    | 9                        | NR            | 920    | 0                        | NR            |
| 405    | 11                       | NR            | 535    | 718                      | NR            | 665    | 349                      | NR            | 795    | 8                        | NR            | 925    | 0                        | NR            |
| 410    | 22                       | NR            | 540    | 732                      | NR            | 670    | 307                      | NR            | 800    | 7                        | NR            | 930    | 0                        | NR            |
| 415    | 43                       | NR            | 545    | 749                      | NR            | 675    | 269                      | NR            | 805    | 6                        | NR            | 935    | 0                        | NR            |
| 420    | 86                       | NR            | 550    | 762                      | NR            | 680    | 235                      | NR            | 810    | 5                        | NR            | 940    | 0                        | NR            |
| 425    | 164                      | NR            | 555    | 778                      | NR            | 685    | 204                      | NR            | 815    | 5                        | NR            | 945    | 0                        | NR            |
| 430    | 288                      | NR            | 560    | 792                      | NR            | 690    | 178                      | NR            | 820    | 4                        | NR            | 950    | 0                        | NR            |
| 435    | 478                      | NR            | 565    | 809                      | NR            | 695    | 153                      | NR            | 825    | 3                        | NR            | 955    | 0                        | NR            |
| 440    | 766                      | NR            | 570    | 827                      | NR            | 700    | 132                      | NR            | 830    | 3                        | NR            | 960    | 0                        | NR            |
| 445    | 1000                     | NR            | 575    | 845                      | NR            | 705    | 114                      | NR            | 835    | 3                        | NR            | 965    | 0                        | NR            |
| 450    | 726                      | NR            | 580    | 862                      | NR            | 710    | 98                       | NR            | 840    | 2                        | NR            | 970    | 0                        | NR            |
| 455    | 425                      | NR            | 585    | 875                      | NR            | 715    | 84                       | NR            | 845    | 2                        | NR            | 975    | 0                        | NR            |
| 460    | 324                      | NR            | 590    | 887                      | NR            | 720    | 73                       | NR            | 850    | 2                        | NR            | 980    | 0                        | NR            |
| 465    | 225                      | NR            | 595    | 890                      | NR            | 725    | 63                       | NR            | 855    | 1                        | NR            | 985    | 0                        | NR            |
| 470    | 157                      | NR            | 600    | 887                      | NR            | 730    | 54                       | NR            | 860    | 1                        | NR            | 990    | 0                        | NR            |
| 475    | 147                      | NR            | 605    | 875                      | NR            | 735    | 46                       | NR            | 865    | 1                        | NR            | 995    | 0                        | NR            |
| 480    | 154                      | NR            | 610    | 856                      | NR            | 740    | 40                       | NR            | 870    | 1                        | NR            | 1000   | 0                        | NR            |
| 485    | 184                      | NR            | 615    | 828                      | NR            | 745    | 34                       | NR            | 875    | 1                        | NR            |        |                          |               |

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Melanopic Flux vs. Wavelength



Melanopic Lumens: NR

M/P: 3.06

| $\lambda$ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | $\lambda$ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | $\lambda$ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | $\lambda$ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | $\lambda$ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) |
|----------------|--------------------------|---------------|----------------|--------------------------|---------------|----------------|--------------------------|---------------|----------------|--------------------------|---------------|----------------|--------------------------|---------------|
| 360            | 0                        | NR            | 490            | 242                      | NR            | 620            | 792                      | NR            | 750            | 29                       | NR            | 880            | 1                        | NR            |
| 365            | 0                        | NR            | 495            | 320                      | NR            | 625            | 748                      | NR            | 755            | 25                       | NR            | 885            | 1                        | NR            |
| 370            | 0                        | NR            | 500            | 401                      | NR            | 630            | 703                      | NR            | 760            | 22                       | NR            | 890            | 1                        | NR            |
| 375            | 0                        | NR            | 505            | 479                      | NR            | 635            | 651                      | NR            | 765            | 19                       | NR            | 895            | 1                        | NR            |
| 380            | 0                        | NR            | 510            | 546                      | NR            | 640            | 599                      | NR            | 770            | 16                       | NR            | 900            | 1                        | NR            |
| 385            | 0                        | NR            | 515            | 602                      | NR            | 645            | 545                      | NR            | 775            | 14                       | NR            | 905            | 0                        | NR            |
| 390            | 2                        | NR            | 520            | 645                      | NR            | 650            | 493                      | NR            | 780            | 12                       | NR            | 910            | 0                        | NR            |
| 395            | 4                        | NR            | 525            | 674                      | NR            | 655            | 443                      | NR            | 785            | 10                       | NR            | 915            | 0                        | NR            |
| 400            | 6                        | NR            | 530            | 699                      | NR            | 660            | 394                      | NR            | 790            | 9                        | NR            | 920            | 0                        | NR            |
| 405            | 11                       | NR            | 535            | 718                      | NR            | 665            | 349                      | NR            | 795            | 8                        | NR            | 925            | 0                        | NR            |
| 410            | 22                       | NR            | 540            | 732                      | NR            | 670            | 307                      | NR            | 800            | 7                        | NR            | 930            | 0                        | NR            |
| 415            | 43                       | NR            | 545            | 749                      | NR            | 675            | 269                      | NR            | 805            | 6                        | NR            | 935            | 0                        | NR            |
| 420            | 86                       | NR            | 550            | 762                      | NR            | 680            | 235                      | NR            | 810            | 5                        | NR            | 940            | 0                        | NR            |
| 425            | 164                      | NR            | 555            | 778                      | NR            | 685            | 204                      | NR            | 815            | 5                        | NR            | 945            | 0                        | NR            |
| 430            | 288                      | NR            | 560            | 792                      | NR            | 690            | 178                      | NR            | 820            | 4                        | NR            | 950            | 0                        | NR            |
| 435            | 478                      | NR            | 565            | 809                      | NR            | 695            | 153                      | NR            | 825            | 3                        | NR            | 955            | 0                        | NR            |
| 440            | 766                      | NR            | 570            | 827                      | NR            | 700            | 132                      | NR            | 830            | 3                        | NR            | 960            | 0                        | NR            |
| 445            | 1000                     | NR            | 575            | 845                      | NR            | 705            | 114                      | NR            | 835            | 3                        | NR            | 965            | 0                        | NR            |
| 450            | 726                      | NR            | 580            | 862                      | NR            | 710            | 98                       | NR            | 840            | 2                        | NR            | 970            | 0                        | NR            |
| 455            | 425                      | NR            | 585            | 875                      | NR            | 715            | 84                       | NR            | 845            | 2                        | NR            | 975            | 0                        | NR            |
| 460            | 324                      | NR            | 590            | 887                      | NR            | 720            | 73                       | NR            | 850            | 2                        | NR            | 980            | 0                        | NR            |
| 465            | 225                      | NR            | 595            | 890                      | NR            | 725            | 63                       | NR            | 855            | 1                        | NR            | 985            | 0                        | NR            |
| 470            | 157                      | NR            | 600            | 887                      | NR            | 730            | 54                       | NR            | 860            | 1                        | NR            | 990            | 0                        | NR            |
| 475            | 147                      | NR            | 605            | 875                      | NR            | 735            | 46                       | NR            | 865            | 1                        | NR            | 995            | 0                        | NR            |
| 480            | 154                      | NR            | 610            | 856                      | NR            | 740            | 40                       | NR            | 870            | 1                        | NR            | 1000           | 0                        | NR            |
| 485            | 184                      | NR            | 615            | 828                      | NR            | 745            | 34                       | NR            | 875            | 1                        | NR            |                |                          |               |

**Summary**

$R_f = 81.8$   
 $R_g = 98.6$   
 CIE  $R_a = 80.2$   
 $R_9 = 6.7$



**Color Vector Graphics**



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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 73 | CES51 = 93 | CES76 = 66 |
| CES02 = 61 | CES27 = 91 | CES52 = 93 | CES77 = 80 |
| CES03 = 31 | CES28 = 87 | CES53 = 83 | CES78 = 66 |
| CES04 = 69 | CES29 = 71 | CES54 = 89 | CES79 = 88 |
| CES05 = 48 | CES30 = 77 | CES55 = 88 | CES80 = 85 |
| CES06 = 50 | CES31 = 74 | CES56 = 80 | CES81 = 83 |
| CES07 = 41 | CES32 = 70 | CES57 = 79 | CES82 = 93 |
| CES08 = 40 | CES33 = 77 | CES58 = 80 | CES83 = 91 |
| CES09 = 29 | CES34 = 79 | CES59 = 92 | CES84 = 91 |
| CES10 = 74 | CES35 = 88 | CES60 = 95 | CES85 = 84 |
| CES11 = 57 | CES36 = 98 | CES61 = 91 | CES86 = 78 |
| CES12 = 63 | CES37 = 85 | CES62 = 90 | CES87 = 84 |
| CES13 = 42 | CES38 = 85 | CES63 = 81 | CES88 = 85 |
| CES14 = 74 | CES39 = 95 | CES64 = 81 | CES89 = 78 |
| CES15 = 71 | CES40 = 90 | CES65 = 76 | CES90 = 84 |
| CES16 = 47 | CES41 = 90 | CES66 = 78 | CES91 = 85 |
| CES17 = 49 | CES42 = 84 | CES67 = 76 | CES92 = 71 |
| CES18 = 56 | CES43 = 81 | CES68 = 80 | CES93 = 84 |
| CES19 = 71 | CES44 = 99 | CES69 = 86 | CES94 = 65 |
| CES20 = 65 | CES45 = 87 | CES70 = 73 | CES95 = 77 |
| CES21 = 86 | CES46 = 85 | CES71 = 70 | CES96 = 83 |
| CES22 = 78 | CES47 = 84 | CES72 = 90 | CES97 = 87 |
| CES23 = 91 | CES48 = 79 | CES73 = 65 | CES98 = 81 |
| CES24 = 90 | CES49 = 84 | CES74 = 98 | CES99 = 75 |
| CES25 = 71 | CES50 = 91 | CES75 = 68 |            |



Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)