

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

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Peachtree City, GA 30269

Scaled data based on original data using  
LM-79-2024 Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Test Report Prepared for  
Cooper Lighting Solutions

Brand: STREETWORKS

Report Number: P1457048

Luminaire Tested: GLAN-SB9B-730-U-T4LG

Issue Date: 05/20/2026

**Test Information**

Test Method: LM-79-2024  
Report Number: P1457048  
Test Lab: INNOVATION CENTER(G1)  
Issue Date: 5/21/2026  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: STREETWORKS  
Catalog Number: GLAN-SB9B-730-U-T4LG  
Description: GALLEON II AREA AND ROADWAY HIGH DENSITY LUMINAIRE 450mA 9xLight Square  
PACKAGE 70CRI 3000K FIXTURE w/ TYPE IV LOW GLARE  
Light Source: (234) 3000K CCT, 70 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

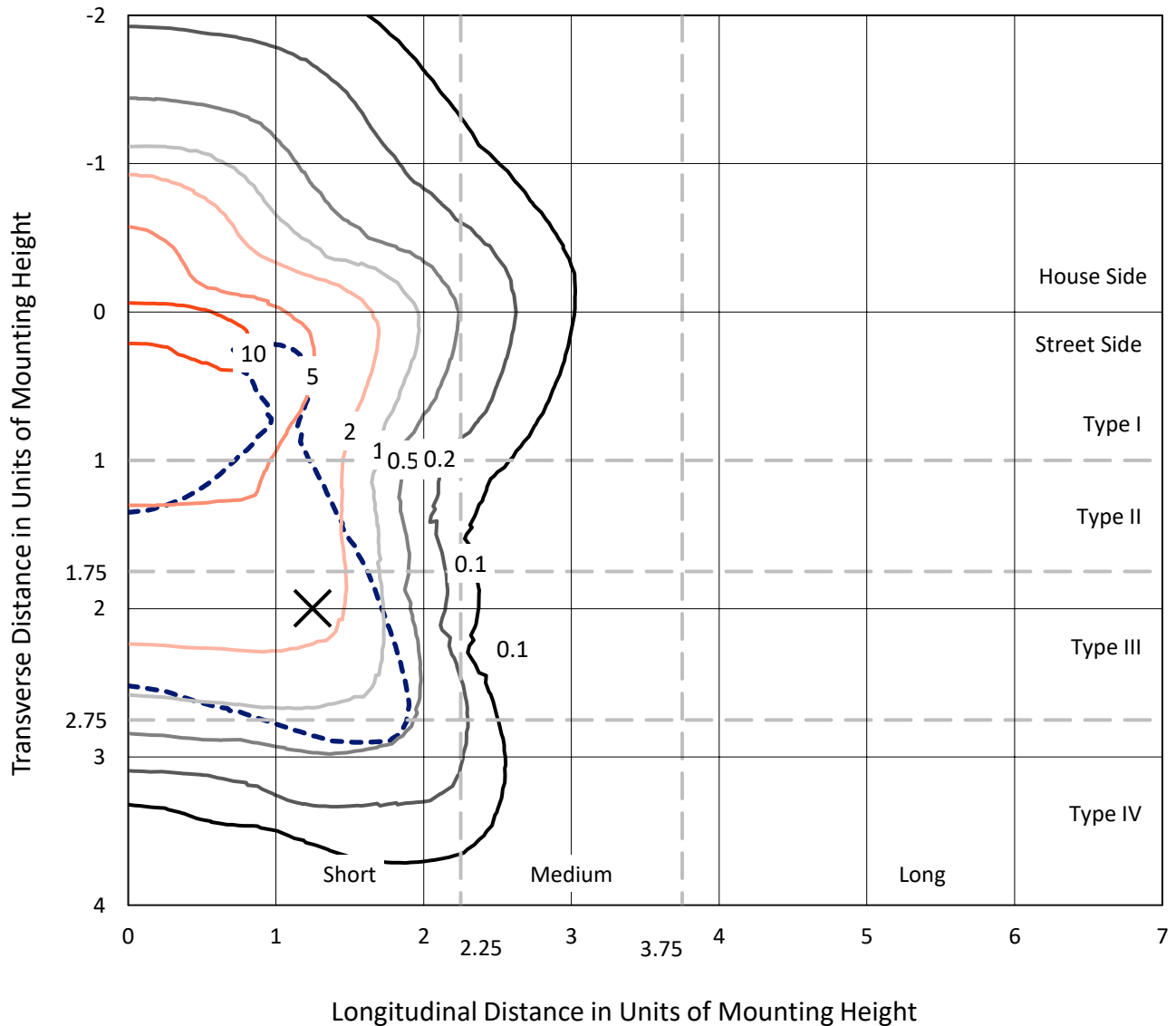
Lumens per Lamp: N/A  
Luminaire Lumens: 50184.1 lumens  
Efficiency: N/A  
Efficacy: 152.3 lumens/watt  
Luminous Opening: Rectangular (W 1.5' x L: 1.5' x H: 0')  
IES Classification: Type IV - Short  
BUG Rating: B4 - U0 - G5  
  
Input Watts (W): 329.5  
Input Voltage (V): 120  
Input Current (Ain): 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

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### Iso-Footcandle Lines of Horizontal Illumination

× Max cd  
 - - - 1/2 Max cd

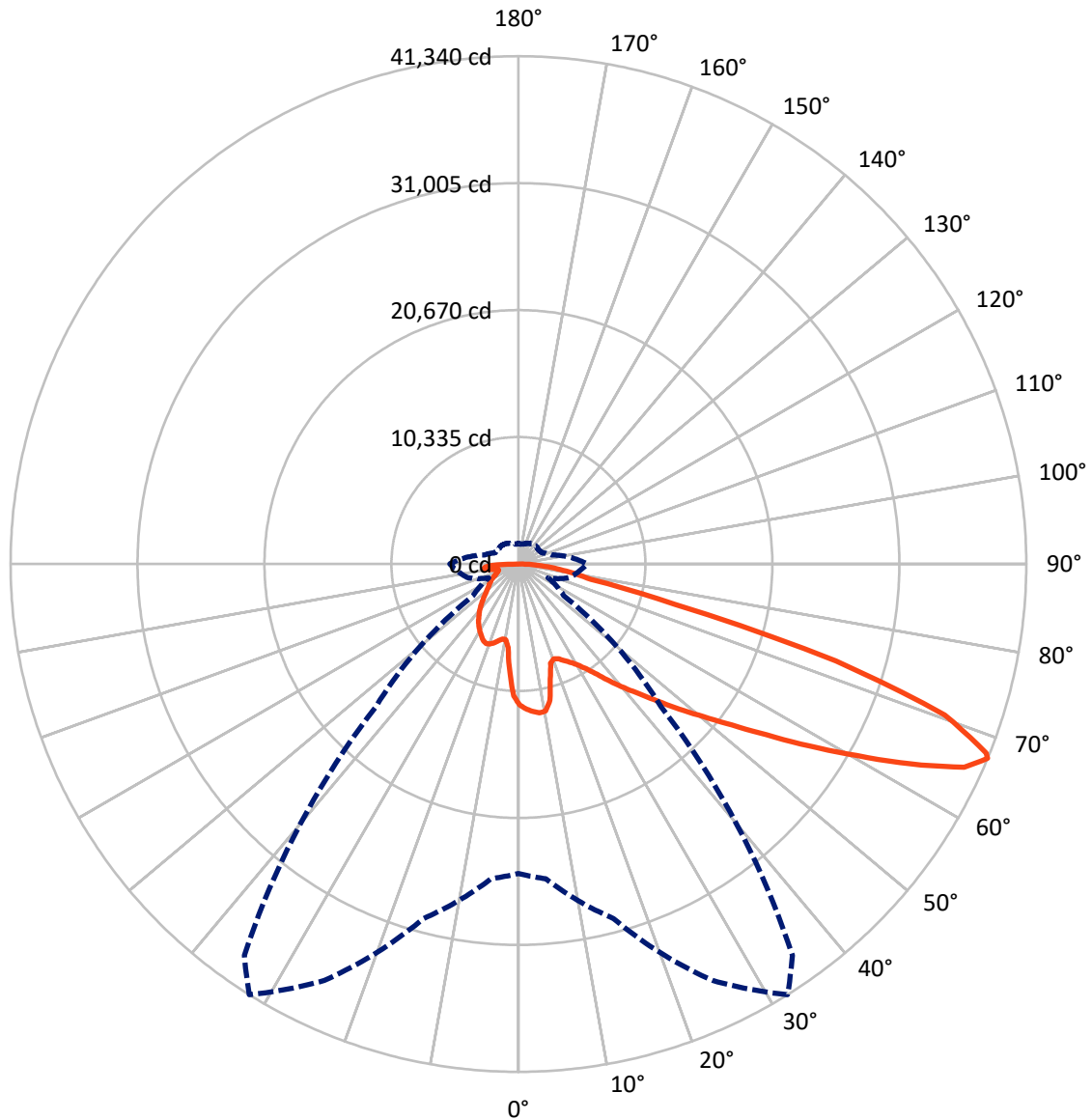


Based on 30 foot mounting height. Maximum calculated value = 13.8 fc  
 Type IV - Short - N/A

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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    | 11880.9  | 0.0    | 11880.9 |
|                    | % Fixture | 23.7     | 0.0    | 23.7    |
| <b>Street Side</b> | Lumens    | 38303.2  | 0.0    | 38303.2 |
|                    | % Fixture | 76.3     | 0.0    | 76.3    |
| <b>Total</b>       | Lumens    | 50184.1  | 0.0    | 50184.1 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**Coefficient of Utilization**

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 1001.9  | 2.0       |
| 10°-20°   | 2660.0  | 5.3       |
| 20°-30°   | 4343.9  | 8.7       |
| 30°-40°   | 6402.5  | 12.8      |
| 40°-50°   | 8829.4  | 17.6      |
| 50°-60°   | 11154.2 | 22.2      |
| 60°-70°   | 10795.3 | 21.5      |
| 70°-80°   | 3852.8  | 7.7       |
| 80°-90°   | 1144.1  | 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°    | 50184.1 | 100.0     |
| 0°-180°   | 50184.1 | 100.0     |



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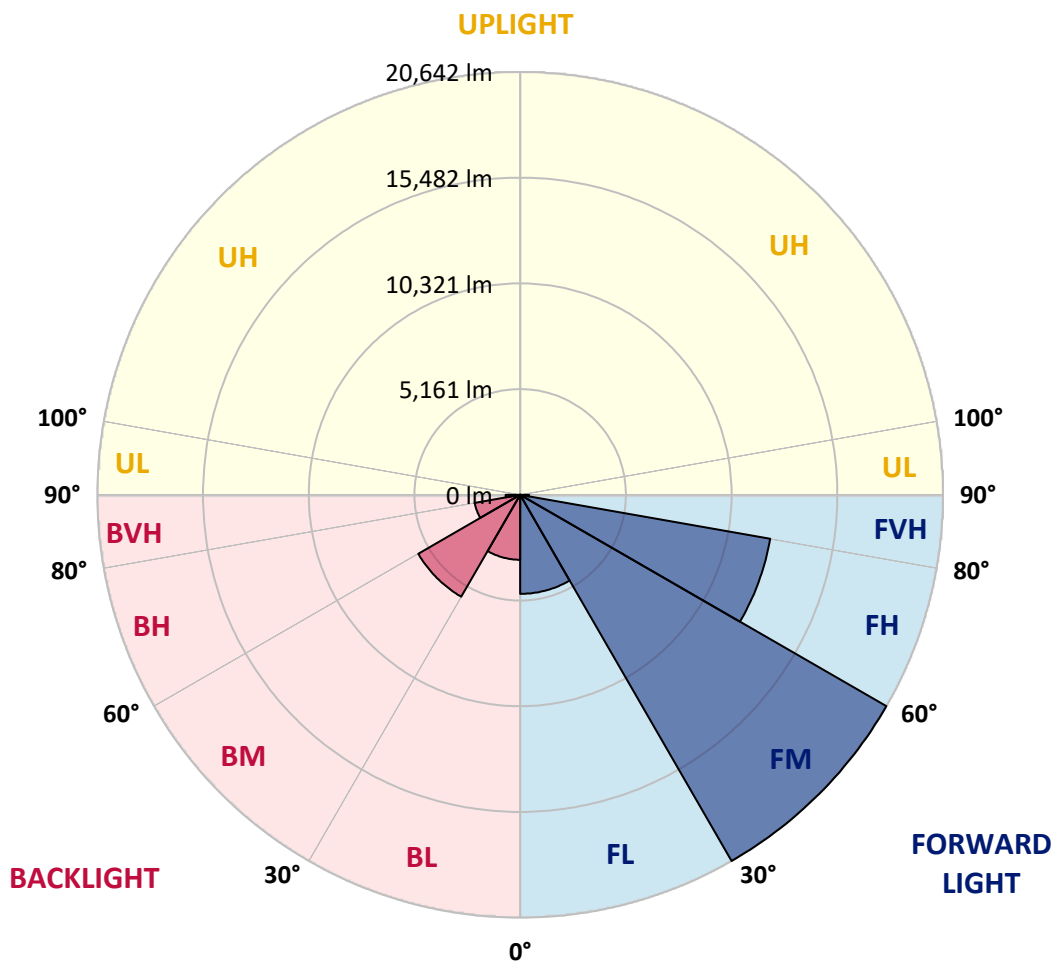
CATALOG NUMBER: GLAN-SB9B-730-U-T4LG

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

| Zone           | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |         |
|----------------|---------|-----------|-------------------------|------|---------|
|                |         |           | B                       | U    | G       |
| FL (0°-30°)    | 4835.3  | 9.6       |                         |      |         |
| FM (30°-60°)   | 20642.3 | 41.1      |                         |      |         |
| FH (60°-80°)   | 12394.4 | 24.7      |                         |      | G5      |
| FVH (80°-90°)  | 431.1   | 0.9       |                         |      | G3/500  |
| BL (0°-30°)    | 3170.4  | 6.3       | B4/5000                 |      |         |
| BM (30°-60°)   | 5743.9  | 11.4      | B4/8500                 |      |         |
| BH (60°-80°)   | 2253.6  | 4.5       | B3/2500                 |      | G3/2500 |
| BVH (80°-90°)  | 713.0   | 1.4       |                         |      | G4/750  |
| 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°    | 11466.1 | 11466.1 | 11466.1 | 11466.1 | 11466.1 | 11466.1 | 11466.1 | 11466.1 | 11466.1 | 11466.1 | 11466.1 |
| 2.5°  | 11900.6 | 11867.2 | 11833.8 | 11856.1 | 11811.5 | 11800.3 | 11744.6 | 11722.3 | 11655.5 | 11644.3 | 11521.8 |
| 5°    | 12145.8 | 12078.9 | 12067.8 | 12090.1 | 12045.5 | 12045.5 | 12000.9 | 11967.5 | 11867.2 | 11811.5 | 11633.2 |
| 7.5°  | 12145.8 | 12134.6 | 12156.9 | 12234.9 | 12246.1 | 12246.1 | 12246.1 | 12257.2 | 12156.9 | 12078.9 | 11800.3 |
| 10°   | 11454.9 | 11343.5 | 11588.6 | 11978.6 | 12168.1 | 12279.5 | 12480.1 | 12602.6 | 12524.6 | 12468.9 | 12090.1 |
| 12.5° | 9393.5  | 9404.6  | 9794.6  | 10630.3 | 11388.1 | 11711.2 | 12546.9 | 12992.6 | 13026.1 | 12936.9 | 12457.8 |
| 15°   | 7967.2  | 8022.9  | 8223.5  | 8825.2  | 9694.3  | 10173.5 | 12156.9 | 13338.1 | 13605.5 | 13516.4 | 12903.5 |
| 17.5° | 7532.6  | 7566.0  | 7655.2  | 8000.6  | 8490.9  | 8880.9  | 11098.3 | 13560.9 | 14307.5 | 14196.1 | 13404.9 |
| 20°   | 7465.8  | 7488.0  | 7599.5  | 7889.2  | 8223.5  | 8446.3  | 10017.5 | 13382.6 | 14964.9 | 14920.4 | 13861.8 |
| 22.5° | 7476.9  | 7499.2  | 7644.0  | 8045.2  | 8390.6  | 8580.0  | 9672.0  | 12970.4 | 15655.8 | 15700.4 | 14329.8 |
| 25°   | 7499.2  | 7510.3  | 7733.2  | 8268.0  | 8702.6  | 8936.6  | 9894.9  | 12602.6 | 16235.2 | 16614.1 | 14842.4 |
| 27.5° | 7621.8  | 7655.2  | 7956.0  | 8557.8  | 9070.3  | 9337.8  | 10418.6 | 12725.2 | 16870.4 | 17650.4 | 15455.2 |
| 30°   | 7956.0  | 7978.3  | 8346.0  | 8970.0  | 9527.2  | 9805.8  | 11042.6 | 13215.5 | 17650.4 | 18720.1 | 16056.9 |
| 32.5° | 8479.8  | 8502.0  | 8925.5  | 9571.8  | 10173.5 | 10507.8 | 11856.1 | 14151.5 | 18519.5 | 19845.5 | 16658.7 |
| 35°   | 9204.0  | 9215.2  | 9694.3  | 10385.2 | 11020.3 | 11399.2 | 12803.2 | 15210.1 | 19422.1 | 20803.8 | 17104.4 |
| 37.5° | 10062.1 | 10140.1 | 10630.3 | 11354.6 | 12101.2 | 12446.6 | 13917.5 | 16446.9 | 20224.4 | 21617.3 | 17360.7 |
| 40°   | 11243.2 | 11265.5 | 11744.6 | 12446.6 | 13237.8 | 13572.1 | 15031.8 | 17616.9 | 21104.7 | 22096.4 | 17594.7 |
| 42.5° | 12457.8 | 12647.2 | 13048.4 | 13828.4 | 14418.9 | 14686.4 | 16302.1 | 18686.7 | 21806.7 | 22118.7 | 17494.4 |
| 45°   | 14084.6 | 14229.5 | 14630.6 | 15321.5 | 15912.1 | 16224.1 | 17672.7 | 19667.2 | 22163.3 | 21929.3 | 17271.5 |
| 47.5° | 15945.5 | 16034.7 | 16357.8 | 16981.8 | 17639.2 | 17862.1 | 19099.0 | 20224.4 | 22297.0 | 21795.5 | 17171.2 |
| 50°   | 18140.7 | 18140.7 | 18374.7 | 18909.5 | 19511.2 | 19823.2 | 20413.8 | 20558.7 | 22687.0 | 21561.5 | 17427.5 |
| 52.5° | 19990.4 | 20079.5 | 20391.5 | 21149.3 | 21751.0 | 22107.5 | 21439.0 | 21071.3 | 21895.8 | 20257.8 | 17505.5 |
| 55°   | 21762.1 | 21862.4 | 22564.4 | 23511.5 | 24536.7 | 24926.7 | 22720.4 | 20815.0 | 19232.7 | 18352.4 | 16970.7 |
| 57.5° | 23455.8 | 23667.5 | 24547.8 | 26397.6 | 27946.4 | 27913.0 | 24347.3 | 18519.5 | 15700.4 | 16246.4 | 15800.7 |
| 60°   | 25818.1 | 26041.0 | 27445.0 | 29773.9 | 31668.2 | 30877.0 | 24369.6 | 15410.7 | 12234.9 | 12970.4 | 13605.5 |
| 62.5° | 27790.4 | 28169.3 | 30230.7 | 34108.5 | 35846.8 | 34609.9 | 22352.7 | 11800.3 | 8123.2  | 9048.0  | 10518.9 |
| 65°   | 27612.1 | 28113.6 | 31311.6 | 37295.3 | 39891.6 | 38743.9 | 19399.8 | 7465.8  | 4189.7  | 6184.3  | 7365.5  |
| 67°   | 25183.0 | 25729.0 | 29874.2 | 37406.8 | 41340.2 | 38888.8 | 16380.1 | 4512.9  | 2663.2  | 4290.0  | 5114.6  |
| 67.5° | 23790.1 | 24592.4 | 29161.0 | 37195.0 | 41072.8 | 38275.9 | 15020.6 | 3777.4  | 2507.2  | 3989.2  | 4657.7  |
| 70°   | 14630.6 | 15923.2 | 21884.7 | 32882.7 | 36816.2 | 32035.9 | 8346.0  | 2139.4  | 2039.2  | 2674.3  | 3220.3  |
| 72.5° | 4401.5  | 4791.5  | 8446.3  | 21093.5 | 27021.6 | 23745.5 | 3755.2  | 1649.2  | 1827.4  | 2150.6  | 2484.9  |
| 75°   | 2139.4  | 2284.3  | 3487.7  | 8624.6  | 13159.8 | 13092.9 | 2094.9  | 1415.2  | 1693.7  | 1805.2  | 1961.2  |
| 77.5° | 1370.6  | 1459.7  | 2172.9  | 4824.9  | 6028.3  | 5370.9  | 1515.4  | 1236.9  | 1504.3  | 1482.0  | 1459.7  |
| 80°   | 858.0   | 902.6   | 1392.9  | 2796.9  | 4446.0  | 3710.6  | 1114.3  | 1014.0  | 1292.6  | 1147.7  | 1036.3  |
| 82.5° | 557.1   | 612.9   | 891.4   | 1704.9  | 3175.7  | 2763.4  | 735.4   | 724.3   | 1069.7  | 913.7   | 802.3   |
| 85°   | 367.7   | 412.3   | 568.3   | 1002.9  | 1883.2  | 1972.3  | 479.1   | 501.4   | 824.6   | 690.9   | 612.9   |
| 87.5° | 133.7   | 167.1   | 289.7   | 445.7   | 880.3   | 1092.0  | 200.6   | 189.4   | 401.1   | 323.1   | 256.3   |
| 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: P1457048

CATALOG NUMBER: GLAN-SB9B-730-U-T4LG

**CANDELA DISTRIBUTION (continued):**

|       | 90°     | 95°     | 105°    | 115°    | 125°    | 135°    | 145°    | 155°    | 165°    | 175°    | 180°    |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 11466.1 | 11466.1 | 11466.1 | 11466.1 | 11466.1 | 11466.1 | 11466.1 | 11466.1 | 11466.1 | 11466.1 | 11466.1 |
| 2.5°  | 11499.5 | 11466.1 | 11310.1 | 11176.3 | 11076.1 | 10942.3 | 10797.5 | 10630.3 | 10518.9 | 10541.2 | 10507.8 |
| 5°    | 11555.2 | 11466.1 | 11165.2 | 10708.3 | 10262.6 | 9705.5  | 8992.3  | 8568.9  | 8245.8  | 8078.6  | 8123.2  |
| 7.5°  | 11677.8 | 11521.8 | 10886.6 | 9961.8  | 8802.9  | 7666.3  | 6964.3  | 6563.2  | 6373.7  | 6295.7  | 6284.6  |
| 10°   | 11889.5 | 11622.1 | 10530.1 | 8802.9  | 7287.5  | 6518.6  | 6262.3  | 6150.9  | 6128.6  | 6128.6  | 6117.5  |
| 12.5° | 12145.8 | 11722.3 | 9928.3  | 7677.5  | 6563.2  | 6284.6  | 6240.0  | 6251.2  | 6284.6  | 6318.0  | 6262.3  |
| 15°   | 12457.8 | 11766.9 | 9181.8  | 6997.8  | 6418.3  | 6351.5  | 6418.3  | 6496.3  | 6552.0  | 6596.6  | 6540.9  |
| 17.5° | 12769.8 | 11722.3 | 8479.8  | 6674.6  | 6440.6  | 6529.7  | 6663.5  | 6786.0  | 6819.5  | 6886.3  | 6841.7  |
| 20°   | 12992.6 | 11566.3 | 7878.0  | 6552.0  | 6496.3  | 6696.9  | 6864.0  | 6997.8  | 7064.6  | 7109.2  | 7064.6  |
| 22.5° | 13159.8 | 11365.8 | 7443.5  | 6429.5  | 6496.3  | 6741.5  | 6942.0  | 7098.0  | 7176.0  | 7220.6  | 7164.9  |
| 25°   | 13304.6 | 11087.2 | 7109.2  | 6251.2  | 6362.6  | 6596.6  | 6819.5  | 6975.5  | 7086.9  | 7153.8  | 7120.3  |
| 27.5° | 13482.9 | 10864.3 | 6797.2  | 5983.7  | 6084.0  | 6306.9  | 6540.9  | 6730.3  | 6942.0  | 7053.5  | 7031.2  |
| 30°   | 13683.5 | 10752.9 | 6496.3  | 5694.0  | 5760.9  | 5983.7  | 6262.3  | 6518.6  | 6808.3  | 6953.2  | 6953.2  |
| 32.5° | 13917.5 | 10674.9 | 6217.7  | 5415.5  | 5471.2  | 5716.3  | 5983.7  | 6217.7  | 6529.7  | 6763.7  | 6752.6  |
| 35°   | 14017.8 | 10585.8 | 5994.9  | 5159.2  | 5270.6  | 5471.2  | 5682.9  | 5838.9  | 6162.0  | 6440.6  | 6462.9  |
| 37.5° | 14118.1 | 10552.3 | 5883.5  | 4958.6  | 5047.7  | 5203.7  | 5315.2  | 5393.2  | 5694.0  | 5983.7  | 5994.9  |
| 40°   | 14240.6 | 10708.3 | 5961.5  | 4824.9  | 4746.9  | 4902.9  | 4958.6  | 5003.2  | 5159.2  | 5348.6  | 5348.6  |
| 42.5° | 14162.6 | 10819.8 | 6139.7  | 4702.3  | 4379.2  | 4557.5  | 4579.7  | 4568.6  | 4579.7  | 4590.9  | 4579.7  |
| 45°   | 13962.1 | 10708.3 | 6139.7  | 4512.9  | 3989.2  | 4178.6  | 4167.4  | 4111.7  | 4022.6  | 3788.6  | 3755.2  |
| 47.5° | 13917.5 | 10641.5 | 5905.7  | 4200.9  | 3599.2  | 3755.2  | 3777.4  | 3666.0  | 3409.7  | 3164.6  | 3086.6  |
| 50°   | 14106.9 | 10764.1 | 5538.0  | 3822.0  | 3264.9  | 3398.6  | 3454.3  | 3264.9  | 2975.2  | 2718.9  | 2674.3  |
| 52.5° | 14385.5 | 10920.1 | 5003.2  | 3409.7  | 2986.3  | 3120.0  | 3186.9  | 2975.2  | 2674.3  | 2473.7  | 2451.4  |
| 55°   | 14352.1 | 10920.1 | 4401.5  | 3030.9  | 2774.6  | 2874.9  | 2986.3  | 2763.4  | 2529.4  | 2418.0  | 2406.9  |
| 57.5° | 13627.8 | 10507.8 | 3955.7  | 2763.4  | 2574.0  | 2663.2  | 2808.0  | 2596.3  | 2373.4  | 2395.7  | 2429.2  |
| 60°   | 12212.6 | 9438.0  | 3621.4  | 2585.2  | 2395.7  | 2484.9  | 2640.9  | 2395.7  | 2106.0  | 2028.0  | 2028.0  |
| 62.5° | 10062.1 | 7777.8  | 3354.0  | 2406.9  | 2228.6  | 2340.0  | 2418.0  | 2094.9  | 1905.4  | 1816.3  | 1816.3  |
| 65°   | 7543.8  | 6017.2  | 3075.4  | 2262.0  | 2083.7  | 2206.3  | 2117.2  | 1961.2  | 1771.7  | 1704.9  | 1716.0  |
| 67°   | 5593.7  | 4668.9  | 2841.4  | 2139.4  | 1994.6  | 2050.3  | 1983.4  | 1872.0  | 1682.6  | 1626.9  | 1682.6  |
| 67.5° | 5025.5  | 4434.9  | 2785.7  | 2106.0  | 1972.3  | 2016.9  | 1950.0  | 1860.9  | 1660.3  | 1604.6  | 1660.3  |
| 70°   | 3454.3  | 3409.7  | 2484.9  | 1950.0  | 1849.7  | 1805.2  | 1838.6  | 1727.2  | 1560.0  | 1537.7  | 1593.4  |
| 72.5° | 2629.7  | 2718.9  | 2228.6  | 1816.3  | 1716.0  | 1660.3  | 1738.3  | 1626.9  | 1459.7  | 1493.2  | 1548.9  |
| 75°   | 2061.4  | 2195.2  | 1994.6  | 1626.9  | 1560.0  | 1571.2  | 1727.2  | 1682.6  | 1548.9  | 1582.3  | 1593.4  |
| 77.5° | 1526.6  | 1771.7  | 1704.9  | 1415.2  | 1359.4  | 1515.4  | 1950.0  | 2083.7  | 1849.7  | 1794.0  | 1716.0  |
| 80°   | 1114.3  | 1270.3  | 1437.4  | 1170.0  | 1136.6  | 1459.7  | 2406.9  | 2663.2  | 2284.3  | 2061.4  | 2005.7  |
| 82.5° | 824.6   | 891.4   | 1181.1  | 936.0   | 824.6   | 1303.7  | 2674.3  | 3131.2  | 2718.9  | 2295.4  | 2228.6  |
| 85°   | 590.6   | 690.9   | 936.0   | 690.9   | 546.0   | 1069.7  | 2618.6  | 3064.3  | 2696.6  | 2172.9  | 2117.2  |
| 87.5° | 211.7   | 300.9   | 401.1   | 312.0   | 278.6   | 735.4   | 2161.7  | 2206.3  | 1682.6  | 768.9   | 780.0   |
| 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: SP1-2407-184-4

Test Date: 10/10/2024

Luminaire Tested: GSS-SB1A-730-U-5WQ

Data in this report applies to families of products including GSS-SB1A-730-U-5WQ

**Test Information**

Test Method: LM-79-2019  
 Report Number: SP1-2407-184-4  
 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-730-U-5WQ**  
 Description: GALLEON II SITE SLIM 1SQ 350MA 5WQ HIGH DENSITY LIGHTSQUARE WITH 70 CRI 3000K CCT 26 LEDS

**Spectral Parameters**

CCT (K): 2985  
 CIE u': 0.2504  
 CIE v': 0.5243  
 Duv: 0.0019  
 CIE x: 0.4408  
 CIE y: 0.4101  
 CIE z: 0.1491  
 Peak Wavelength (nm): 595  
 Dominant Wavelength (nm): 582  
 Purity: 55.41818  
 Rf: 73.8  
 Rg: 94.4

|           |      |      |       |
|-----------|------|------|-------|
| CRI (Ra): | 70.8 |      |       |
| R1:       | 66.3 | R9:  | -43.2 |
| R2:       | 80.6 | R10: | 57.6  |
| R3:       | 94.5 | R11: | 64.8  |
| R4:       | 68.2 | R12: | 53.5  |
| R5:       | 66.5 | R13: | 68.7  |
| R6:       | 74.7 | R14: | 97.0  |
| R7:       | 76.2 | R15: | 56.4  |
| R8:       | 39.6 |      |       |



**Test Conditions**

Stabilization Time: 36M  
 Operation Time: 1H 36M  
 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



CCT = 2985K  
 CIE x = 0.4408  
 CIE y = 0.4101  
 Duv = 0.0019

Point lies inside the ANSI 3000K 4-step quadrangle

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**Photopic Flux vs. Wavelength**



Photopic Luminous Efficacy Function

**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    | 142                      | NR            | 620    | 803                      | NR            | 750    | 17                       | NR            | 880    | 0                        | NR            |
| 365    | 0                        | NR            | 495    | 189                      | NR            | 625    | 734                      | NR            | 755    | 15                       | NR            | 885    | 0                        | NR            |
| 370    | 0                        | NR            | 500    | 240                      | NR            | 630    | 670                      | NR            | 760    | 13                       | NR            | 890    | 0                        | NR            |
| 375    | 0                        | NR            | 505    | 290                      | NR            | 635    | 600                      | NR            | 765    | 11                       | NR            | 895    | 0                        | NR            |
| 380    | 0                        | NR            | 510    | 335                      | NR            | 640    | 535                      | NR            | 770    | 9                        | NR            | 900    | 0                        | NR            |
| 385    | 0                        | NR            | 515    | 375                      | NR            | 645    | 473                      | NR            | 775    | 8                        | NR            | 905    | 0                        | NR            |
| 390    | 1                        | NR            | 520    | 408                      | NR            | 650    | 415                      | NR            | 780    | 7                        | NR            | 910    | 0                        | NR            |
| 395    | 2                        | NR            | 525    | 434                      | NR            | 655    | 362                      | NR            | 785    | 6                        | NR            | 915    | 0                        | NR            |
| 400    | 4                        | NR            | 530    | 461                      | NR            | 660    | 313                      | NR            | 790    | 5                        | NR            | 920    | 0                        | NR            |
| 405    | 8                        | NR            | 535    | 486                      | NR            | 665    | 271                      | NR            | 795    | 4                        | NR            | 925    | 0                        | NR            |
| 410    | 16                       | NR            | 540    | 514                      | NR            | 670    | 231                      | NR            | 800    | 4                        | NR            | 930    | 0                        | NR            |
| 415    | 33                       | NR            | 545    | 549                      | NR            | 675    | 198                      | NR            | 805    | 3                        | NR            | 935    | 0                        | NR            |
| 420    | 69                       | NR            | 550    | 591                      | NR            | 680    | 169                      | NR            | 810    | 3                        | NR            | 940    | 0                        | NR            |
| 425    | 131                      | NR            | 555    | 640                      | NR            | 685    | 144                      | NR            | 815    | 2                        | NR            | 945    | 0                        | NR            |
| 430    | 227                      | NR            | 560    | 695                      | NR            | 690    | 123                      | NR            | 820    | 2                        | NR            | 950    | 0                        | NR            |
| 435    | 369                      | NR            | 565    | 757                      | NR            | 695    | 104                      | NR            | 825    | 2                        | NR            | 955    | 0                        | NR            |
| 440    | 517                      | NR            | 570    | 822                      | NR            | 700    | 88                       | NR            | 830    | 2                        | NR            | 960    | 0                        | NR            |
| 445    | 498                      | NR            | 575    | 882                      | NR            | 705    | 75                       | NR            | 835    | 1                        | NR            | 965    | 0                        | NR            |
| 450    | 315                      | NR            | 580    | 935                      | NR            | 710    | 63                       | NR            | 840    | 1                        | NR            | 970    | 0                        | NR            |
| 455    | 204                      | NR            | 585    | 972                      | NR            | 715    | 54                       | NR            | 845    | 1                        | NR            | 975    | 0                        | NR            |
| 460    | 145                      | NR            | 590    | 996                      | NR            | 720    | 46                       | NR            | 850    | 1                        | NR            | 980    | 0                        | NR            |
| 465    | 100                      | NR            | 595    | 1000                     | NR            | 725    | 39                       | NR            | 855    | 1                        | NR            | 985    | 0                        | NR            |
| 470    | 78                       | NR            | 600    | 989                      | NR            | 730    | 33                       | NR            | 860    | 1                        | NR            | 990    | 0                        | NR            |
| 475    | 76                       | NR            | 605    | 960                      | NR            | 735    | 28                       | NR            | 865    | 1                        | NR            | 995    | 0                        | NR            |
| 480    | 83                       | NR            | 610    | 918                      | NR            | 740    | 24                       | NR            | 870    | 1                        | NR            | 1000   | 0                        | NR            |
| 485    | 105                      | NR            | 615    | 864                      | NR            | 745    | 20                       | NR            | 875    | 1                        | NR            |        |                          |               |

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**Scotopic Flux vs. Wavelength**



**Scotopic Lumens: NR**

**S/P: 1.19**

| $\lambda$ (nm) | Power W <sup>^</sup> /nm | Lumens ( $\phi$ /nm) | $\lambda$ (nm) | Power W <sup>^</sup> /nm | Lumens ( $\phi$ /nm) | $\lambda$ (nm) | Power W <sup>^</sup> /nm | Lumens ( $\phi$ /nm) | $\lambda$ (nm) | Power W <sup>^</sup> /nm | Lumens ( $\phi$ /nm) | $\lambda$ (nm) | Power W <sup>^</sup> /nm | Lumens ( $\phi$ /nm) |
|----------------|--------------------------|----------------------|----------------|--------------------------|----------------------|----------------|--------------------------|----------------------|----------------|--------------------------|----------------------|----------------|--------------------------|----------------------|
| 360            | 0                        | NR                   | 490            | 142                      | NR                   | 620            | 803                      | NR                   | 750            | 17                       | NR                   | 880            | 0                        | NR                   |
| 365            | 0                        | NR                   | 495            | 189                      | NR                   | 625            | 734                      | NR                   | 755            | 15                       | NR                   | 885            | 0                        | NR                   |
| 370            | 0                        | NR                   | 500            | 240                      | NR                   | 630            | 670                      | NR                   | 760            | 13                       | NR                   | 890            | 0                        | NR                   |
| 375            | 0                        | NR                   | 505            | 290                      | NR                   | 635            | 600                      | NR                   | 765            | 11                       | NR                   | 895            | 0                        | NR                   |
| 380            | 0                        | NR                   | 510            | 335                      | NR                   | 640            | 535                      | NR                   | 770            | 9                        | NR                   | 900            | 0                        | NR                   |
| 385            | 0                        | NR                   | 515            | 375                      | NR                   | 645            | 473                      | NR                   | 775            | 8                        | NR                   | 905            | 0                        | NR                   |
| 390            | 1                        | NR                   | 520            | 408                      | NR                   | 650            | 415                      | NR                   | 780            | 7                        | NR                   | 910            | 0                        | NR                   |
| 395            | 2                        | NR                   | 525            | 434                      | NR                   | 655            | 362                      | NR                   | 785            | 6                        | NR                   | 915            | 0                        | NR                   |
| 400            | 4                        | NR                   | 530            | 461                      | NR                   | 660            | 313                      | NR                   | 790            | 5                        | NR                   | 920            | 0                        | NR                   |
| 405            | 8                        | NR                   | 535            | 486                      | NR                   | 665            | 271                      | NR                   | 795            | 4                        | NR                   | 925            | 0                        | NR                   |
| 410            | 16                       | NR                   | 540            | 514                      | NR                   | 670            | 231                      | NR                   | 800            | 4                        | NR                   | 930            | 0                        | NR                   |
| 415            | 33                       | NR                   | 545            | 549                      | NR                   | 675            | 198                      | NR                   | 805            | 3                        | NR                   | 935            | 0                        | NR                   |
| 420            | 69                       | NR                   | 550            | 591                      | NR                   | 680            | 169                      | NR                   | 810            | 3                        | NR                   | 940            | 0                        | NR                   |
| 425            | 131                      | NR                   | 555            | 640                      | NR                   | 685            | 144                      | NR                   | 815            | 2                        | NR                   | 945            | 0                        | NR                   |
| 430            | 227                      | NR                   | 560            | 695                      | NR                   | 690            | 123                      | NR                   | 820            | 2                        | NR                   | 950            | 0                        | NR                   |
| 435            | 369                      | NR                   | 565            | 757                      | NR                   | 695            | 104                      | NR                   | 825            | 2                        | NR                   | 955            | 0                        | NR                   |
| 440            | 517                      | NR                   | 570            | 822                      | NR                   | 700            | 88                       | NR                   | 830            | 2                        | NR                   | 960            | 0                        | NR                   |
| 445            | 498                      | NR                   | 575            | 882                      | NR                   | 705            | 75                       | NR                   | 835            | 1                        | NR                   | 965            | 0                        | NR                   |
| 450            | 315                      | NR                   | 580            | 935                      | NR                   | 710            | 63                       | NR                   | 840            | 1                        | NR                   | 970            | 0                        | NR                   |
| 455            | 204                      | NR                   | 585            | 972                      | NR                   | 715            | 54                       | NR                   | 845            | 1                        | NR                   | 975            | 0                        | NR                   |
| 460            | 145                      | NR                   | 590            | 996                      | NR                   | 720            | 46                       | NR                   | 850            | 1                        | NR                   | 980            | 0                        | NR                   |
| 465            | 100                      | NR                   | 595            | 1000                     | NR                   | 725            | 39                       | NR                   | 855            | 1                        | NR                   | 985            | 0                        | NR                   |
| 470            | 78                       | NR                   | 600            | 989                      | NR                   | 730            | 33                       | NR                   | 860            | 1                        | NR                   | 990            | 0                        | NR                   |
| 475            | 76                       | NR                   | 605            | 960                      | NR                   | 735            | 28                       | NR                   | 865            | 1                        | NR                   | 995            | 0                        | NR                   |
| 480            | 83                       | NR                   | 610            | 918                      | NR                   | 740            | 24                       | NR                   | 870            | 1                        | NR                   | 1000           | 0                        | NR                   |
| 485            | 105                      | NR                   | 615            | 864                      | NR                   | 745            | 20                       | NR                   | 875            | 1                        | NR                   |                |                          |                      |

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**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: NR**

**M/P: 2.13**

| 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    | 142                      | NR            | 620    | 803                      | NR            | 750    | 17                       | NR            | 880    | 0                        | NR            |
| 365    | 0                        | NR            | 495    | 189                      | NR            | 625    | 734                      | NR            | 755    | 15                       | NR            | 885    | 0                        | NR            |
| 370    | 0                        | NR            | 500    | 240                      | NR            | 630    | 670                      | NR            | 760    | 13                       | NR            | 890    | 0                        | NR            |
| 375    | 0                        | NR            | 505    | 290                      | NR            | 635    | 600                      | NR            | 765    | 11                       | NR            | 895    | 0                        | NR            |
| 380    | 0                        | NR            | 510    | 335                      | NR            | 640    | 535                      | NR            | 770    | 9                        | NR            | 900    | 0                        | NR            |
| 385    | 0                        | NR            | 515    | 375                      | NR            | 645    | 473                      | NR            | 775    | 8                        | NR            | 905    | 0                        | NR            |
| 390    | 1                        | NR            | 520    | 408                      | NR            | 650    | 415                      | NR            | 780    | 7                        | NR            | 910    | 0                        | NR            |
| 395    | 2                        | NR            | 525    | 434                      | NR            | 655    | 362                      | NR            | 785    | 6                        | NR            | 915    | 0                        | NR            |
| 400    | 4                        | NR            | 530    | 461                      | NR            | 660    | 313                      | NR            | 790    | 5                        | NR            | 920    | 0                        | NR            |
| 405    | 8                        | NR            | 535    | 486                      | NR            | 665    | 271                      | NR            | 795    | 4                        | NR            | 925    | 0                        | NR            |
| 410    | 16                       | NR            | 540    | 514                      | NR            | 670    | 231                      | NR            | 800    | 4                        | NR            | 930    | 0                        | NR            |
| 415    | 33                       | NR            | 545    | 549                      | NR            | 675    | 198                      | NR            | 805    | 3                        | NR            | 935    | 0                        | NR            |
| 420    | 69                       | NR            | 550    | 591                      | NR            | 680    | 169                      | NR            | 810    | 3                        | NR            | 940    | 0                        | NR            |
| 425    | 131                      | NR            | 555    | 640                      | NR            | 685    | 144                      | NR            | 815    | 2                        | NR            | 945    | 0                        | NR            |
| 430    | 227                      | NR            | 560    | 695                      | NR            | 690    | 123                      | NR            | 820    | 2                        | NR            | 950    | 0                        | NR            |
| 435    | 369                      | NR            | 565    | 757                      | NR            | 695    | 104                      | NR            | 825    | 2                        | NR            | 955    | 0                        | NR            |
| 440    | 517                      | NR            | 570    | 822                      | NR            | 700    | 88                       | NR            | 830    | 2                        | NR            | 960    | 0                        | NR            |
| 445    | 498                      | NR            | 575    | 882                      | NR            | 705    | 75                       | NR            | 835    | 1                        | NR            | 965    | 0                        | NR            |
| 450    | 315                      | NR            | 580    | 935                      | NR            | 710    | 63                       | NR            | 840    | 1                        | NR            | 970    | 0                        | NR            |
| 455    | 204                      | NR            | 585    | 972                      | NR            | 715    | 54                       | NR            | 845    | 1                        | NR            | 975    | 0                        | NR            |
| 460    | 145                      | NR            | 590    | 996                      | NR            | 720    | 46                       | NR            | 850    | 1                        | NR            | 980    | 0                        | NR            |
| 465    | 100                      | NR            | 595    | 1000                     | NR            | 725    | 39                       | NR            | 855    | 1                        | NR            | 985    | 0                        | NR            |
| 470    | 78                       | NR            | 600    | 989                      | NR            | 730    | 33                       | NR            | 860    | 1                        | NR            | 990    | 0                        | NR            |
| 475    | 76                       | NR            | 605    | 960                      | NR            | 735    | 28                       | NR            | 865    | 1                        | NR            | 995    | 0                        | NR            |
| 480    | 83                       | NR            | 610    | 918                      | NR            | 740    | 24                       | NR            | 870    | 1                        | NR            | 1000   | 0                        | NR            |
| 485    | 105                      | NR            | 615    | 864                      | NR            | 745    | 20                       | NR            | 875    | 1                        | NR            |        |                          |               |

**Summary**

$R_f = 73.8$   
 $R_g = 94.4$   
 CIE  $R_a = 70.8$   
 $R_9 = -43.2$



**Color Vector Graphics**



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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 63 | CES51 = 86 | CES76 = 61 |
| CES02 = 62 | CES27 = 83 | CES52 = 86 | CES77 = 81 |
| CES03 = 31 | CES28 = 86 | CES53 = 75 | CES78 = 64 |
| CES04 = 71 | CES29 = 58 | CES54 = 81 | CES79 = 86 |
| CES05 = 49 | CES30 = 61 | CES55 = 80 | CES80 = 86 |
| CES06 = 51 | CES31 = 63 | CES56 = 71 | CES81 = 70 |
| CES07 = 41 | CES32 = 61 | CES57 = 69 | CES82 = 94 |
| CES08 = 40 | CES33 = 65 | CES58 = 72 | CES83 = 88 |
| CES09 = 29 | CES34 = 77 | CES59 = 85 | CES84 = 90 |
| CES10 = 76 | CES35 = 88 | CES60 = 93 | CES85 = 80 |
| CES11 = 59 | CES36 = 89 | CES61 = 86 | CES86 = 60 |
| CES12 = 65 | CES37 = 85 | CES62 = 81 | CES87 = 78 |
| CES13 = 43 | CES38 = 69 | CES63 = 73 | CES88 = 75 |
| CES14 = 74 | CES39 = 93 | CES64 = 72 | CES89 = 66 |
| CES15 = 71 | CES40 = 89 | CES65 = 67 | CES90 = 72 |
| CES16 = 47 | CES41 = 83 | CES66 = 70 | CES91 = 95 |
| CES17 = 50 | CES42 = 87 | CES67 = 68 | CES92 = 59 |
| CES18 = 56 | CES43 = 77 | CES68 = 73 | CES93 = 76 |
| CES19 = 73 | CES44 = 99 | CES69 = 83 | CES94 = 48 |
| CES20 = 66 | CES45 = 83 | CES70 = 66 | CES95 = 70 |
| CES21 = 87 | CES46 = 77 | CES71 = 66 | CES96 = 76 |
| CES22 = 79 | CES47 = 74 | CES72 = 88 | CES97 = 82 |
| CES23 = 92 | CES48 = 62 | CES73 = 59 | CES98 = 73 |
| CES24 = 91 | CES49 = 77 | CES74 = 93 | CES99 = 60 |
| CES25 = 73 | CES50 = 85 | CES75 = 67 |            |



Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)