

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: P1459202

Luminaire Tested: GLAN-SB7D-940-U-T4LG-HSS

Issue Date: 05/20/2026

**Test Information**

Test Method: LM-79-2024  
Report Number: P1459202  
Test Lab: INNOVATION CENTER(G1)  
Issue Date: 5/22/2026  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: STREETWORKS  
Catalog Number: GLAN-SB7D-940-U-T4LG-HSS  
Description: GALLEON II AREA AND ROADWAY HIGH DENSITY LUMINAIRE 900mA 7xLight Square PACKAGE 90CRI 4000K FIXTURE w/ TYPE IV LOW GLARE WITH HOUSE SIDE SHIELD  
Light Source: (182) 4000K CCT, 90 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

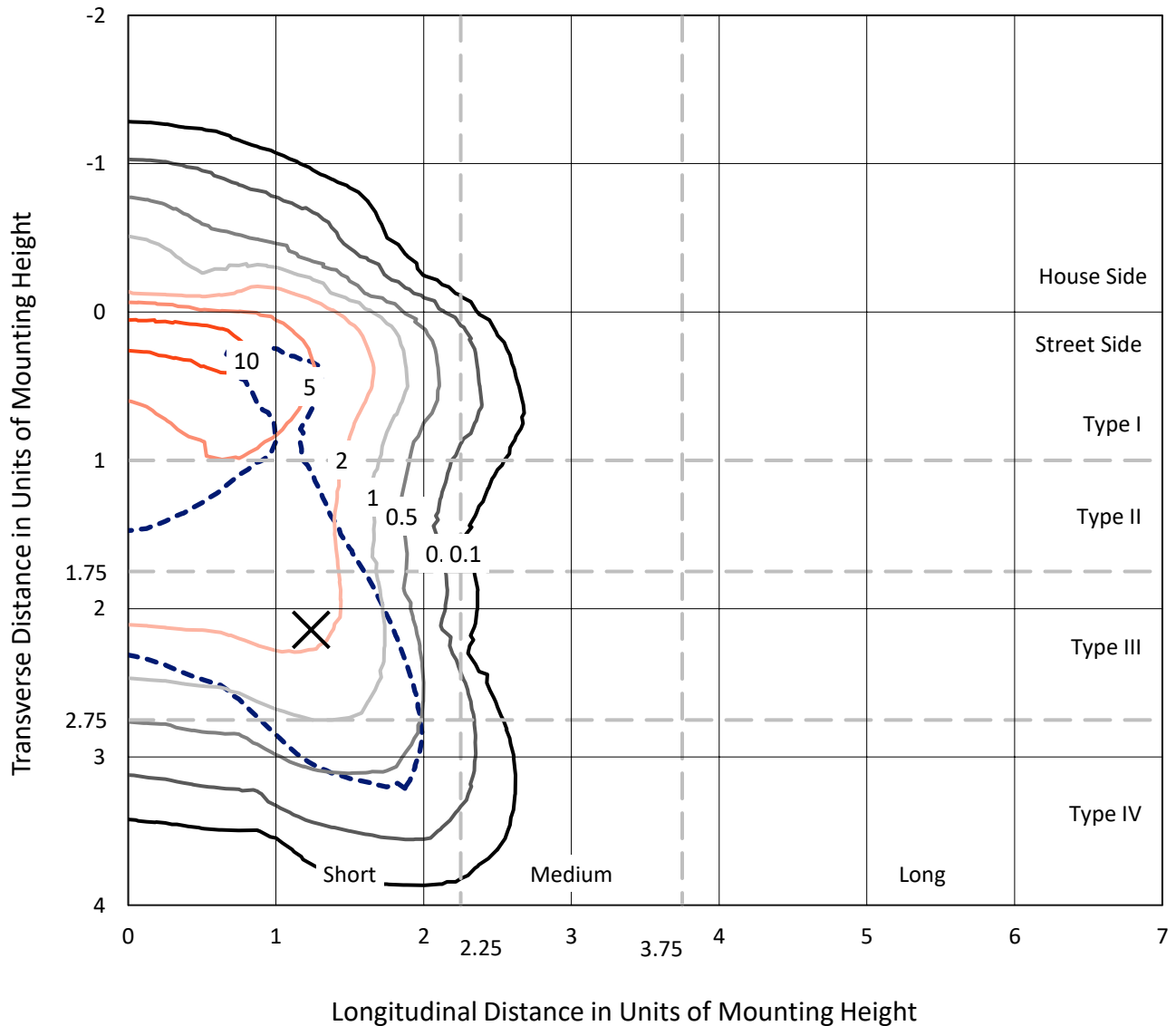
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 38030.4 lumens  
Efficiency: N/A  
Efficacy: 74.2 lumens/watt  
Luminous Opening: Rectangular (W 1.5' x L: 1.5' x H: 0')  
IES Classification: Type IV - Short  
BUG Rating: B2 - U0 - G4  
  
Input Watts (W): 512.8  
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

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### Iso-Footcandle Lines of Horizontal Illumination

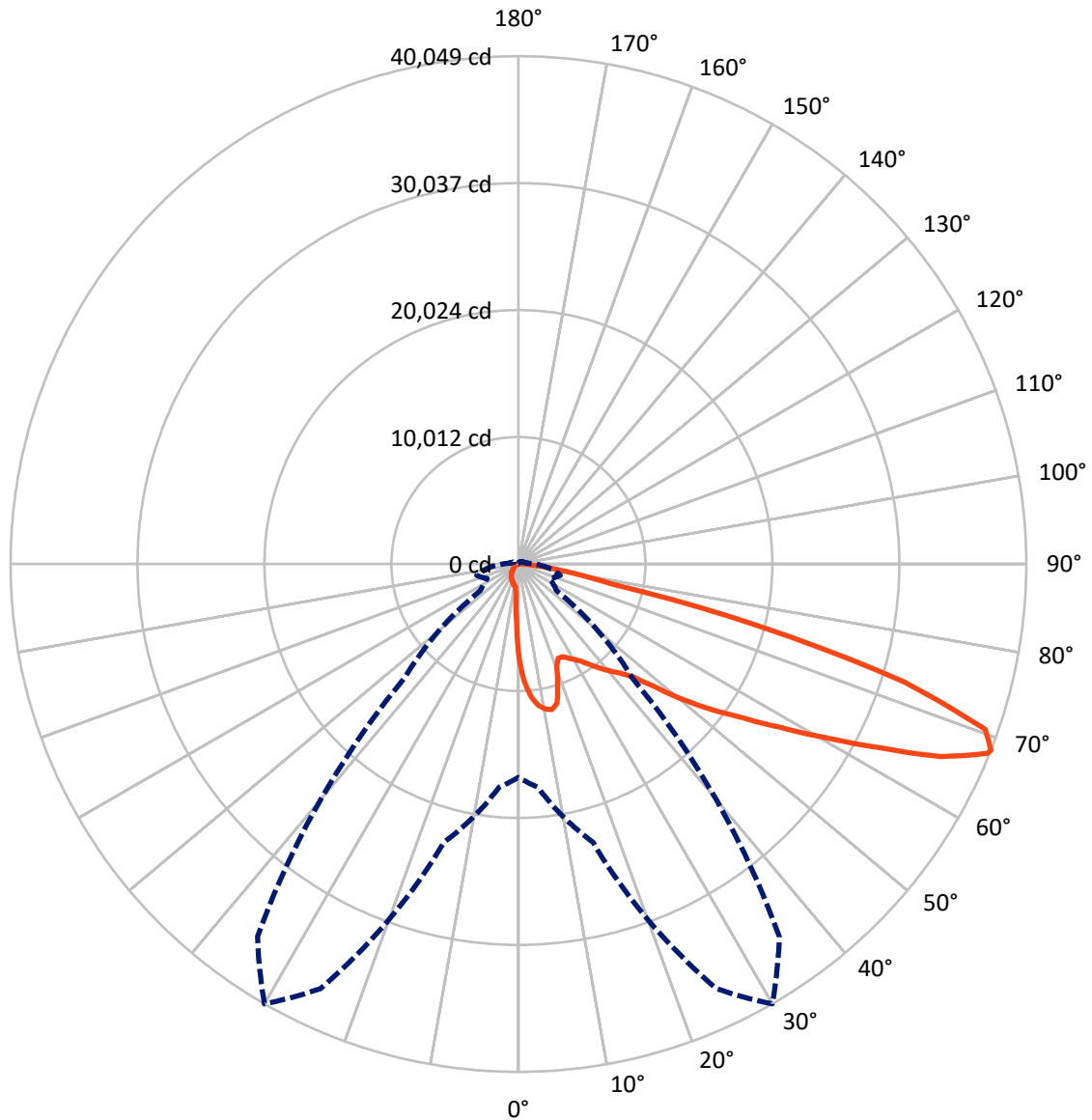
× Max cd  
 - - - 1/2 Max cd



Based on 30 foot mounting height. Maximum calculated value = 12.7 fc  
 Type IV - Short - N/A

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### Luminous Intensity Polar Plot



— Vertical Plane Through 30-Deg Lateral      - - - Horizontal Cone Through 68-Deg Vertical

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**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 2902.7   | 0.0    | 2902.7  |
|                    | % Fixture | 7.6      | 0.0    | 7.6     |
| <b>Street Side</b> | Lumens    | 35127.7  | 0.0    | 35127.7 |
|                    | % Fixture | 92.4     | 0.0    | 92.4    |
| <b>Total</b>       | Lumens    | 38030.4  | 0.0    | 38030.4 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 647.1   | 1.7       |
| 10°-20°   | 1847.4  | 4.9       |
| 20°-30°   | 2903.1  | 7.6       |
| 30°-40°   | 4553.3  | 12.0      |
| 40°-50°   | 6805.9  | 17.9      |
| 50°-60°   | 9054.0  | 23.8      |
| 60°-70°   | 8752.4  | 23.0      |
| 70°-80°   | 3146.2  | 8.3       |
| 80°-90°   | 321.1   | 0.8       |
| 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°    | 38030.4 | 100.0     |
| 0°-180°   | 38030.4 | 100.0     |

**Coefficient of Utilization**



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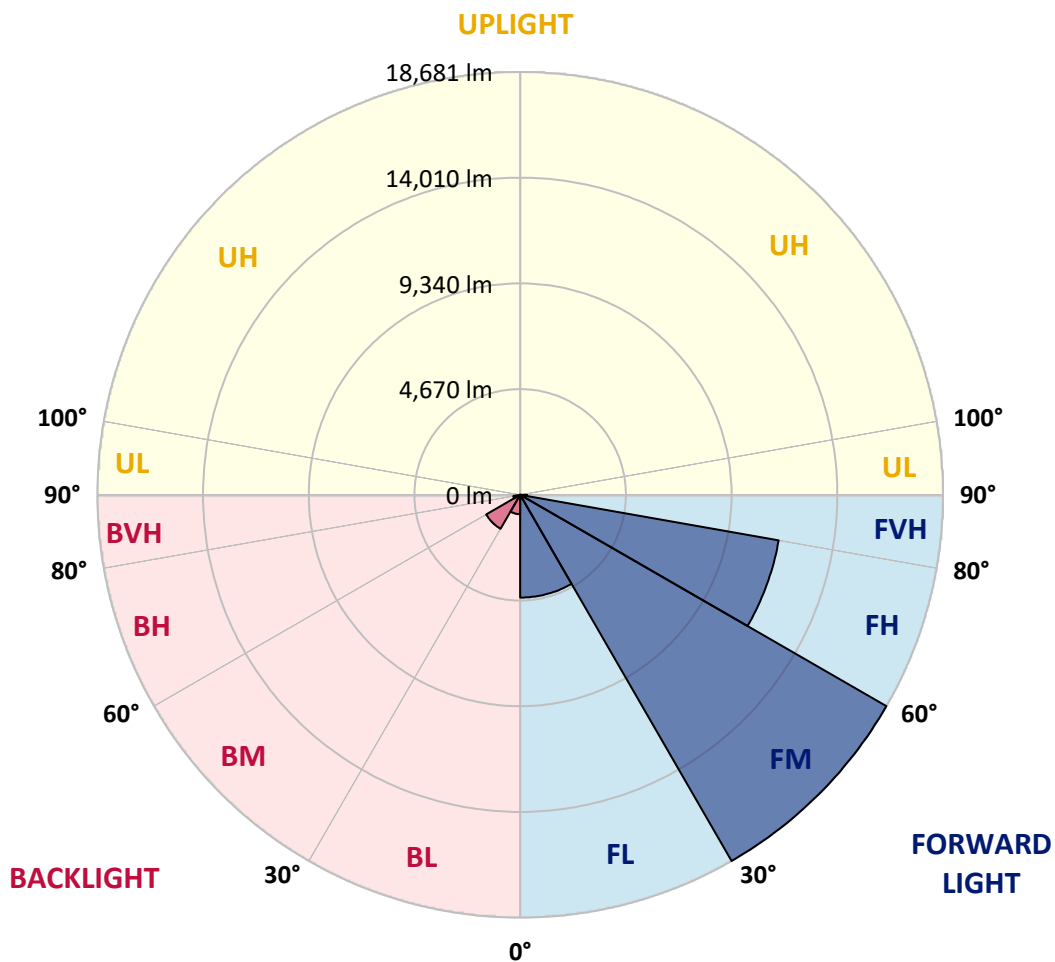
CATALOG NUMBER: GLAN-SB7D-940-U-T4LG-HSS

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

| Zone           | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |          |
|----------------|---------|-----------|-------------------------|------|----------|
|                |         |           | B                       | U    | G        |
| FL (0°-30°)    | 4540.8  | 11.9      |                         |      |          |
| FM (30°-60°)   | 18680.6 | 49.1      |                         |      |          |
| FH (60°-80°)   | 11596.7 | 30.5      |                         |      | G4/12000 |
| FVH (80°-90°)  | 309.7   | 0.8       |                         |      | G3/500   |
| BL (0°-30°)    | 856.8   | 2.3       | B2/1000                 |      |          |
| BM (30°-60°)   | 1732.6  | 4.6       | B2/2500                 |      |          |
| BH (60°-80°)   | 301.9   | 0.8       | B1/500                  |      | G1/500   |
| BVH (80°-90°)  | 11.4    | 0.0       |                         |      | G1/100   |
| UL (90°-100°)  | 0.0     | 0.0       |                         | U0/0 |          |
| UH (100°-180°) | 0.0     | 0.0       |                         | U0/0 |          |

**BUG Rating: B2-U0-G4**

Type IV Short





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 30°     | 35°     | 45°     | 55°     | 65°     | 75°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 7499.2  | 7499.2  | 7499.2  | 7499.2  | 7499.2  | 7499.2  | 7499.2  | 7499.2  | 7499.2  | 7499.2  | 7499.2  |
| 2.5°  | 9584.8  | 9584.8  | 9516.4  | 9425.2  | 9322.7  | 9288.5  | 9094.7  | 8821.2  | 8536.3  | 8205.8  | 7727.1  |
| 5°    | 10815.6 | 10804.3 | 10667.5 | 10667.5 | 10530.7 | 10405.4 | 10211.6 | 9812.7  | 9356.8  | 8764.2  | 7932.2  |
| 7.5°  | 11362.7 | 11385.5 | 11328.5 | 11328.5 | 11248.7 | 11157.6 | 11043.6 | 10656.1 | 10120.4 | 9322.7  | 8137.4  |
| 10°   | 11556.4 | 11567.8 | 11567.8 | 11647.6 | 11624.8 | 11613.4 | 11602.0 | 11385.5 | 10827.0 | 9892.5  | 8353.9  |
| 12.5° | 11089.2 | 11146.2 | 11305.7 | 11659.0 | 11773.0 | 11898.4 | 12069.3 | 12000.9 | 11613.4 | 10610.5 | 8684.4  |
| 15°   | 9584.8  | 9596.2  | 10040.7 | 10918.2 | 11385.5 | 11864.2 | 12525.2 | 12661.9 | 12411.2 | 11385.5 | 9026.3  |
| 17.5° | 7909.4  | 7943.6  | 8296.9  | 9277.1  | 10029.3 | 11134.8 | 12787.3 | 13345.8 | 13254.6 | 12149.1 | 9345.4  |
| 20°   | 7214.2  | 7259.8  | 7430.8  | 8046.2  | 8616.0  | 9641.8  | 12525.2 | 13995.4 | 14029.6 | 12912.7 | 9641.8  |
| 22.5° | 7054.7  | 7088.9  | 7225.6  | 7704.3  | 8057.6  | 8741.4  | 11636.2 | 14508.2 | 14907.1 | 13790.2 | 9995.1  |
| 25°   | 7009.1  | 7043.3  | 7248.4  | 7772.7  | 8103.2  | 8673.0  | 10827.0 | 14781.8 | 15944.2 | 14702.0 | 10337.0 |
| 27.5° | 6974.9  | 7020.5  | 7351.0  | 8023.4  | 8410.9  | 8958.0  | 10678.9 | 14838.7 | 16935.8 | 15670.7 | 10895.4 |
| 30°   | 7020.5  | 7088.9  | 7521.9  | 8285.5  | 8730.0  | 9345.4  | 11032.2 | 14895.7 | 18029.9 | 16776.2 | 11602.0 |
| 32.5° | 7202.8  | 7259.8  | 7784.1  | 8638.8  | 9151.7  | 9846.9  | 11636.2 | 15237.6 | 19067.0 | 17904.5 | 12274.4 |
| 35°   | 7408.0  | 7487.8  | 8114.6  | 9140.3  | 9755.7  | 10542.1 | 12456.8 | 15910.1 | 20058.5 | 18975.8 | 12969.7 |
| 37.5° | 7658.7  | 7749.9  | 8502.1  | 9710.1  | 10416.8 | 11305.7 | 13345.8 | 16844.6 | 20936.1 | 19853.4 | 13664.9 |
| 40°   | 8000.6  | 8103.2  | 8946.6  | 10314.2 | 11077.8 | 11966.7 | 14223.3 | 17767.8 | 21608.5 | 20377.6 | 14120.7 |
| 42.5° | 9345.4  | 9482.2  | 9835.5  | 10906.8 | 11761.6 | 12673.3 | 15089.5 | 18645.3 | 21859.2 | 20548.6 | 14211.9 |
| 45°   | 11852.8 | 11989.5 | 11898.4 | 12103.5 | 12673.3 | 13528.1 | 16035.4 | 19488.7 | 21893.4 | 20503.0 | 14166.3 |
| 47.5° | 14371.5 | 14531.0 | 14451.3 | 14337.3 | 14462.7 | 14872.9 | 17095.3 | 20024.3 | 21711.1 | 20480.2 | 14166.3 |
| 50°   | 16776.2 | 16685.0 | 16696.4 | 16662.3 | 16776.2 | 16992.8 | 18121.1 | 20126.9 | 21665.5 | 20696.8 | 14291.7 |
| 52.5° | 18064.1 | 18109.7 | 18394.6 | 18816.3 | 19067.0 | 19283.5 | 19294.9 | 20286.5 | 21335.0 | 20332.1 | 14143.5 |
| 55°   | 19329.1 | 19420.3 | 20081.3 | 20799.3 | 21357.8 | 21768.1 | 20468.8 | 20183.9 | 19363.3 | 19112.6 | 13368.6 |
| 57.5° | 20753.7 | 20879.1 | 21813.6 | 23295.2 | 24275.4 | 24491.9 | 21631.3 | 18269.2 | 16388.7 | 17368.9 | 11864.2 |
| 60°   | 22714.0 | 22862.2 | 24104.4 | 26326.8 | 27785.6 | 27341.1 | 21722.5 | 15226.2 | 13015.2 | 14417.1 | 9789.9  |
| 62.5° | 24252.6 | 24548.9 | 26794.1 | 30258.7 | 31865.7 | 30452.5 | 20024.3 | 11670.4 | 9094.7  | 10131.8 | 7145.8  |
| 65°   | 22611.4 | 23181.3 | 26839.7 | 34760.5 | 36618.2 | 34110.9 | 17357.5 | 7966.4  | 5128.6  | 6553.2  | 4570.2  |
| 67.5° | 18280.6 | 19078.4 | 23830.9 | 36948.7 | 39877.7 | 36037.0 | 13664.9 | 4228.2  | 2940.4  | 3806.6  | 2404.7  |
| 68°   | 16821.8 | 17688.0 | 22725.4 | 36948.7 | 40048.7 | 35866.0 | 12684.7 | 3658.4  | 2712.5  | 3419.1  | 2085.6  |
| 70°   | 11624.8 | 12240.3 | 17471.4 | 34874.5 | 39045.7 | 32697.7 | 8353.9  | 2097.0  | 2040.0  | 2347.8  | 1379.0  |
| 72.5° | 5698.4  | 6359.5  | 9345.4  | 27637.5 | 31808.7 | 25130.1 | 3806.6  | 1390.4  | 1550.0  | 1720.9  | 1082.7  |
| 75°   | 2268.0  | 2404.7  | 3681.2  | 13630.7 | 19876.2 | 16035.4 | 1994.5  | 1048.5  | 1333.4  | 1344.8  | 854.8   |
| 77.5° | 1299.2  | 1379.0  | 2040.0  | 5014.6  | 7453.6  | 7168.6  | 1287.8  | 752.2   | 1059.9  | 968.7   | 558.4   |
| 80°   | 729.4   | 740.8   | 1151.1  | 2644.1  | 4262.4  | 3818.0  | 877.6   | 547.1   | 809.2   | 683.8   | 376.1   |
| 82.5° | 364.7   | 410.3   | 729.4   | 1458.8  | 2370.6  | 2427.5  | 467.3   | 387.5   | 649.6   | 490.1   | 307.7   |
| 85°   | 262.1   | 284.9   | 524.3   | 809.2   | 1094.1  | 1641.2  | 284.9   | 193.7   | 490.1   | 330.5   | 216.5   |
| 87.5° | 136.8   | 171.0   | 330.5   | 398.9   | 444.5   | 558.4   | 136.8   | 91.2    | 273.5   | 193.7   | 114.0   |
| 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: P1459202

CATALOG NUMBER: GLAN-SB7D-940-U-T4LG-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°     | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 7499.2  | 7499.2 | 7499.2 | 7499.2 | 7499.2 | 7499.2 | 7499.2 | 7499.2 | 7499.2 | 7499.2 | 7499.2 |
| 2.5°  | 7499.2  | 7237.0 | 6701.4 | 6074.5 | 5584.5 | 5083.0 | 4672.7 | 4285.2 | 4102.9 | 4080.1 | 4125.7 |
| 5°    | 7465.0  | 6895.1 | 5675.7 | 4479.0 | 3498.8 | 2815.0 | 2438.9 | 2245.2 | 2142.6 | 2097.0 | 2108.4 |
| 7.5°  | 7396.6  | 6530.4 | 4581.5 | 3031.6 | 2268.0 | 1971.7 | 1880.5 | 1846.3 | 1834.9 | 1834.9 | 1834.9 |
| 10°   | 7328.2  | 6040.4 | 3510.2 | 2222.4 | 1857.7 | 1777.9 | 1755.1 | 1755.1 | 1743.7 | 1743.7 | 1755.1 |
| 12.5° | 7294.0  | 5584.5 | 2723.9 | 1857.7 | 1732.3 | 1698.1 | 1675.3 | 1663.9 | 1663.9 | 1663.9 | 1675.3 |
| 15°   | 7214.2  | 5083.0 | 2199.6 | 1720.9 | 1652.5 | 1607.0 | 1595.6 | 1584.2 | 1584.2 | 1584.2 | 1584.2 |
| 17.5° | 7145.8  | 4592.9 | 1914.7 | 1629.8 | 1572.8 | 1527.2 | 1515.8 | 1504.4 | 1504.4 | 1515.8 | 1515.8 |
| 20°   | 7043.3  | 4125.7 | 1720.9 | 1538.6 | 1493.0 | 1447.4 | 1436.0 | 1424.6 | 1436.0 | 1436.0 | 1436.0 |
| 22.5° | 6917.9  | 3738.2 | 1607.0 | 1470.2 | 1413.2 | 1367.6 | 1367.6 | 1367.6 | 1367.6 | 1367.6 | 1379.0 |
| 25°   | 6838.1  | 3464.7 | 1527.2 | 1390.4 | 1333.4 | 1299.2 | 1287.8 | 1287.8 | 1310.6 | 1310.6 | 1322.0 |
| 27.5° | 6963.5  | 3396.3 | 1538.6 | 1367.6 | 1265.1 | 1230.9 | 1219.5 | 1219.5 | 1242.3 | 1253.7 | 1265.1 |
| 30°   | 7339.6  | 3521.6 | 1675.3 | 1436.0 | 1219.5 | 1162.5 | 1151.1 | 1151.1 | 1185.3 | 1196.7 | 1208.1 |
| 32.5° | 7772.7  | 3783.8 | 1880.5 | 1527.2 | 1185.3 | 1094.1 | 1071.3 | 1071.3 | 1105.5 | 1116.9 | 1128.3 |
| 35°   | 8365.3  | 4194.1 | 2154.0 | 1607.0 | 1208.1 | 1025.7 | 980.1  | 980.1  | 1002.9 | 1025.7 | 1037.1 |
| 37.5° | 9128.9  | 4866.5 | 2473.1 | 1663.9 | 1208.1 | 945.9  | 889.0  | 877.6  | 900.4  | 900.4  | 911.8  |
| 40°   | 9926.7  | 5744.0 | 2803.6 | 1663.9 | 1151.1 | 866.2  | 809.2  | 775.0  | 786.4  | 775.0  | 786.4  |
| 42.5° | 10371.2 | 6450.6 | 3088.6 | 1561.4 | 1082.7 | 786.4  | 729.4  | 683.8  | 672.4  | 649.6  | 661.0  |
| 45°   | 10621.9 | 6769.8 | 3008.8 | 1447.4 | 1014.3 | 729.4  | 661.0  | 604.0  | 581.2  | 547.1  | 547.1  |
| 47.5° | 10621.9 | 6803.9 | 2575.7 | 1356.2 | 945.9  | 683.8  | 592.6  | 535.7  | 501.5  | 467.3  | 478.7  |
| 50°   | 10496.5 | 6496.2 | 2040.0 | 1265.1 | 866.2  | 638.2  | 535.7  | 490.1  | 444.5  | 421.7  | 421.7  |
| 52.5° | 9972.3  | 5493.3 | 1561.4 | 1151.1 | 775.0  | 581.2  | 478.7  | 433.1  | 387.5  | 376.1  | 376.1  |
| 55°   | 9071.9  | 4034.5 | 1265.1 | 1037.1 | 695.2  | 535.7  | 433.1  | 398.9  | 353.3  | 330.5  | 330.5  |
| 57.5° | 7373.8  | 2758.0 | 1048.5 | 934.5  | 615.4  | 478.7  | 387.5  | 353.3  | 296.3  | 273.5  | 273.5  |
| 60°   | 5470.5  | 1800.7 | 889.0  | 820.6  | 524.3  | 433.1  | 341.9  | 296.3  | 250.7  | 227.9  | 216.5  |
| 62.5° | 3692.6  | 1219.5 | 740.8  | 649.6  | 444.5  | 376.1  | 296.3  | 250.7  | 193.7  | 148.2  | 148.2  |
| 65°   | 2302.2  | 945.9  | 615.4  | 512.9  | 387.5  | 330.5  | 250.7  | 193.7  | 136.8  | 102.6  | 91.2   |
| 67.5° | 1322.0  | 763.6  | 501.5  | 398.9  | 330.5  | 262.1  | 193.7  | 159.6  | 114.0  | 79.8   | 68.4   |
| 68°   | 1219.5  | 729.4  | 467.3  | 376.1  | 307.7  | 250.7  | 182.4  | 148.2  | 102.6  | 68.4   | 68.4   |
| 70°   | 991.5   | 649.6  | 398.9  | 307.7  | 262.1  | 205.1  | 159.6  | 125.4  | 79.8   | 45.6   | 45.6   |
| 72.5° | 877.6   | 547.1  | 341.9  | 239.3  | 182.4  | 171.0  | 125.4  | 91.2   | 57.0   | 34.2   | 22.8   |
| 75°   | 718.0   | 433.1  | 273.5  | 182.4  | 125.4  | 125.4  | 91.2   | 57.0   | 22.8   | 0.0    | 0.0    |
| 77.5° | 467.3   | 319.1  | 216.5  | 114.0  | 68.4   | 79.8   | 57.0   | 22.8   | 0.0    | 0.0    | 0.0    |
| 80°   | 307.7   | 239.3  | 148.2  | 57.0   | 34.2   | 34.2   | 11.4   | 0.0    | 0.0    | 0.0    | 0.0    |
| 82.5° | 216.5   | 159.6  | 91.2   | 22.8   | 11.4   | 11.4   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 85°   | 136.8   | 68.4   | 34.2   | 11.4   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 87.5° | 57.0    | 22.8   | 11.4   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 90°   | 0.0     | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

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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: SP1-2407-184-16

Test Date: 10/11/2024

Luminaire Tested: GSS-SB1A-940-U-5WQ

Data in this report applies to families of products including GSS-SB1A-940-U-5WQ

**Test Information**

Test Method: LM-79-2019  
 Report Number: SP1-2407-184-16  
 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-940-U-5WQ**  
 Description: GALLEON II SITE SLIM 1SQ 350MA 5WQ HIGH DENSITY LIGHTSQUARE WITH 90 CRI 4000K CCT 26 LEDS

**Spectral Parameters**

CCT (K): 3856  
 CIE u': 0.2261  
 CIE v': 0.5084  
 Duv: 0.0032  
 CIE x: 0.3896  
 CIE y: 0.3894  
 CIE z: 0.2211  
 Peak Wavelength (nm): 614  
 Dominant Wavelength (nm): 578  
 Purity: 33.77304  
 Rf: 91.8  
 Rg: 98.4

|           |      |      |      |
|-----------|------|------|------|
| CRI (Ra): | 92.1 |      |      |
| R1:       | 91.8 | R9:  | 60.7 |
| R2:       | 94.1 | R10: | 85.2 |
| R3:       | 95.3 | R11: | 92.4 |
| R4:       | 92.8 | R12: | 74.5 |
| R5:       | 91.0 | R13: | 92.3 |
| R6:       | 91.6 | R14: | 97.0 |
| R7:       | 95.0 | R15: | 88.5 |
| R8:       | 85.2 |      |      |



**Test Conditions**

Stabilization Time: 23M  
 Operation Time: 1H 23M  
 Sphere Temperature (°C): 25.2

REPORT NUMBER: SP1-2407-184-16

| 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               | 492                         | NR                      | 620               | 993                         | NR                      | 750               | 73                          | NR                      | 880               | 1                           | NR                      |
| 365               | 0                           | NR                      | 495               | 539                         | NR                      | 625               | 978                         | NR                      | 755               | 62                          | NR                      | 885               | 1                           | NR                      |
| 370               | 0                           | NR                      | 500               | 583                         | NR                      | 630               | 962                         | NR                      | 760               | 54                          | NR                      | 890               | 1                           | NR                      |
| 375               | 0                           | NR                      | 505               | 623                         | NR                      | 635               | 933                         | NR                      | 765               | 46                          | NR                      | 895               | 1                           | NR                      |
| 380               | 0                           | NR                      | 510               | 661                         | NR                      | 640               | 898                         | NR                      | 770               | 39                          | NR                      | 900               | 1                           | NR                      |
| 385               | 0                           | NR                      | 515               | 698                         | NR                      | 645               | 855                         | NR                      | 775               | 34                          | NR                      | 905               | 1                           | NR                      |
| 390               | 0                           | NR                      | 520               | 733                         | NR                      | 650               | 810                         | NR                      | 780               | 29                          | NR                      | 910               | 1                           | NR                      |
| 395               | 1                           | NR                      | 525               | 764                         | NR                      | 655               | 759                         | NR                      | 785               | 25                          | NR                      | 915               | 1                           | NR                      |
| 400               | 3                           | NR                      | 530               | 794                         | NR                      | 660               | 704                         | NR                      | 790               | 21                          | NR                      | 920               | 1                           | NR                      |
| 405               | 6                           | NR                      | 535               | 820                         | NR                      | 665               | 651                         | NR                      | 795               | 18                          | NR                      | 925               | 1                           | NR                      |
| 410               | 12                          | NR                      | 540               | 837                         | NR                      | 670               | 592                         | NR                      | 800               | 16                          | NR                      | 930               | 1                           | NR                      |
| 415               | 22                          | NR                      | 545               | 853                         | NR                      | 675               | 538                         | NR                      | 805               | 13                          | NR                      | 935               | 0                           | NR                      |
| 420               | 42                          | NR                      | 550               | 864                         | NR                      | 680               | 486                         | NR                      | 810               | 12                          | NR                      | 940               | 0                           | NR                      |
| 425               | 79                          | NR                      | 555               | 872                         | NR                      | 685               | 435                         | NR                      | 815               | 10                          | NR                      | 945               | 0                           | NR                      |
| 430               | 147                         | NR                      | 560               | 876                         | NR                      | 690               | 389                         | NR                      | 820               | 9                           | NR                      | 950               | 0                           | NR                      |
| 435               | 278                         | NR                      | 565               | 883                         | NR                      | 695               | 344                         | NR                      | 825               | 7                           | NR                      | 955               | 0                           | NR                      |
| 440               | 515                         | NR                      | 570               | 891                         | NR                      | 700               | 303                         | NR                      | 830               | 6                           | NR                      | 960               | 0                           | NR                      |
| 445               | 832                         | NR                      | 575               | 900                         | NR                      | 705               | 266                         | NR                      | 835               | 5                           | NR                      | 965               | 0                           | NR                      |
| 450               | 874                         | NR                      | 580               | 914                         | NR                      | 710               | 233                         | NR                      | 840               | 5                           | NR                      | 970               | 0                           | NR                      |
| 455               | 659                         | NR                      | 585               | 927                         | NR                      | 715               | 203                         | NR                      | 845               | 4                           | NR                      | 975               | 0                           | NR                      |
| 460               | 567                         | NR                      | 590               | 944                         | NR                      | 720               | 178                         | NR                      | 850               | 4                           | NR                      | 980               | 0                           | NR                      |
| 465               | 485                         | NR                      | 595               | 961                         | NR                      | 725               | 154                         | NR                      | 855               | 3                           | NR                      | 985               | 0                           | NR                      |
| 470               | 401                         | NR                      | 600               | 975                         | NR                      | 730               | 133                         | NR                      | 860               | 3                           | NR                      | 990               | 0                           | NR                      |
| 475               | 393                         | NR                      | 605               | 988                         | NR                      | 735               | 115                         | NR                      | 865               | 2                           | NR                      | 995               | 1                           | NR                      |
| 480               | 417                         | NR                      | 610               | 996                         | NR                      | 740               | 98                          | NR                      | 870               | 2                           | NR                      | 1000              | 0                           | NR                      |
| 485               | 448                         | NR                      | 615               | 998                         | NR                      | 745               | 85                          | NR                      | 875               | 2                           | NR                      |                   |                             |                         |

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**Scotopic Flux vs. Wavelength**



**Scotopic Lumens: NR**

**S/P: 1.72**

| $\lambda$ (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            | 492                      | NR                   | 620            | 993                      | NR                   | 750            | 73                       | NR                   | 880            | 1                        | NR                   |
| 365            | 0                        | NR                   | 495            | 539                      | NR                   | 625            | 978                      | NR                   | 755            | 62                       | NR                   | 885            | 1                        | NR                   |
| 370            | 0                        | NR                   | 500            | 583                      | NR                   | 630            | 962                      | NR                   | 760            | 54                       | NR                   | 890            | 1                        | NR                   |
| 375            | 0                        | NR                   | 505            | 623                      | NR                   | 635            | 933                      | NR                   | 765            | 46                       | NR                   | 895            | 1                        | NR                   |
| 380            | 0                        | NR                   | 510            | 661                      | NR                   | 640            | 898                      | NR                   | 770            | 39                       | NR                   | 900            | 1                        | NR                   |
| 385            | 0                        | NR                   | 515            | 698                      | NR                   | 645            | 855                      | NR                   | 775            | 34                       | NR                   | 905            | 1                        | NR                   |
| 390            | 0                        | NR                   | 520            | 733                      | NR                   | 650            | 810                      | NR                   | 780            | 29                       | NR                   | 910            | 1                        | NR                   |
| 395            | 1                        | NR                   | 525            | 764                      | NR                   | 655            | 759                      | NR                   | 785            | 25                       | NR                   | 915            | 1                        | NR                   |
| 400            | 3                        | NR                   | 530            | 794                      | NR                   | 660            | 704                      | NR                   | 790            | 21                       | NR                   | 920            | 1                        | NR                   |
| 405            | 6                        | NR                   | 535            | 820                      | NR                   | 665            | 651                      | NR                   | 795            | 18                       | NR                   | 925            | 1                        | NR                   |
| 410            | 12                       | NR                   | 540            | 837                      | NR                   | 670            | 592                      | NR                   | 800            | 16                       | NR                   | 930            | 1                        | NR                   |
| 415            | 22                       | NR                   | 545            | 853                      | NR                   | 675            | 538                      | NR                   | 805            | 13                       | NR                   | 935            | 0                        | NR                   |
| 420            | 42                       | NR                   | 550            | 864                      | NR                   | 680            | 486                      | NR                   | 810            | 12                       | NR                   | 940            | 0                        | NR                   |
| 425            | 79                       | NR                   | 555            | 872                      | NR                   | 685            | 435                      | NR                   | 815            | 10                       | NR                   | 945            | 0                        | NR                   |
| 430            | 147                      | NR                   | 560            | 876                      | NR                   | 690            | 389                      | NR                   | 820            | 9                        | NR                   | 950            | 0                        | NR                   |
| 435            | 278                      | NR                   | 565            | 883                      | NR                   | 695            | 344                      | NR                   | 825            | 7                        | NR                   | 955            | 0                        | NR                   |
| 440            | 515                      | NR                   | 570            | 891                      | NR                   | 700            | 303                      | NR                   | 830            | 6                        | NR                   | 960            | 0                        | NR                   |
| 445            | 832                      | NR                   | 575            | 900                      | NR                   | 705            | 266                      | NR                   | 835            | 5                        | NR                   | 965            | 0                        | NR                   |
| 450            | 874                      | NR                   | 580            | 914                      | NR                   | 710            | 233                      | NR                   | 840            | 5                        | NR                   | 970            | 0                        | NR                   |
| 455            | 659                      | NR                   | 585            | 927                      | NR                   | 715            | 203                      | NR                   | 845            | 4                        | NR                   | 975            | 0                        | NR                   |
| 460            | 567                      | NR                   | 590            | 944                      | NR                   | 720            | 178                      | NR                   | 850            | 4                        | NR                   | 980            | 0                        | NR                   |
| 465            | 485                      | NR                   | 595            | 961                      | NR                   | 725            | 154                      | NR                   | 855            | 3                        | NR                   | 985            | 0                        | NR                   |
| 470            | 401                      | NR                   | 600            | 975                      | NR                   | 730            | 133                      | NR                   | 860            | 3                        | NR                   | 990            | 0                        | NR                   |
| 475            | 393                      | NR                   | 605            | 988                      | NR                   | 735            | 115                      | NR                   | 865            | 2                        | NR                   | 995            | 1                        | NR                   |
| 480            | 417                      | NR                   | 610            | 996                      | NR                   | 740            | 98                       | NR                   | 870            | 2                        | NR                   | 1000           | 0                        | NR                   |
| 485            | 448                      | NR                   | 615            | 998                      | NR                   | 745            | 85                       | NR                   | 875            | 2                        | NR                   |                |                          |                      |

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Melanopic Flux vs. Wavelength



Melanopic Lumens: NR

M/P: 3.52

| 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    | 492                      | NR            | 620    | 993                      | NR            | 750    | 73                       | NR            | 880    | 1                        | NR            |
| 365    | 0                        | NR            | 495    | 539                      | NR            | 625    | 978                      | NR            | 755    | 62                       | NR            | 885    | 1                        | NR            |
| 370    | 0                        | NR            | 500    | 583                      | NR            | 630    | 962                      | NR            | 760    | 54                       | NR            | 890    | 1                        | NR            |
| 375    | 0                        | NR            | 505    | 623                      | NR            | 635    | 933                      | NR            | 765    | 46                       | NR            | 895    | 1                        | NR            |
| 380    | 0                        | NR            | 510    | 661                      | NR            | 640    | 898                      | NR            | 770    | 39                       | NR            | 900    | 1                        | NR            |
| 385    | 0                        | NR            | 515    | 698                      | NR            | 645    | 855                      | NR            | 775    | 34                       | NR            | 905    | 1                        | NR            |
| 390    | 0                        | NR            | 520    | 733                      | NR            | 650    | 810                      | NR            | 780    | 29                       | NR            | 910    | 1                        | NR            |
| 395    | 1                        | NR            | 525    | 764                      | NR            | 655    | 759                      | NR            | 785    | 25                       | NR            | 915    | 1                        | NR            |
| 400    | 3                        | NR            | 530    | 794                      | NR            | 660    | 704                      | NR            | 790    | 21                       | NR            | 920    | 1                        | NR            |
| 405    | 6                        | NR            | 535    | 820                      | NR            | 665    | 651                      | NR            | 795    | 18                       | NR            | 925    | 1                        | NR            |
| 410    | 12                       | NR            | 540    | 837                      | NR            | 670    | 592                      | NR            | 800    | 16                       | NR            | 930    | 1                        | NR            |
| 415    | 22                       | NR            | 545    | 853                      | NR            | 675    | 538                      | NR            | 805    | 13                       | NR            | 935    | 0                        | NR            |
| 420    | 42                       | NR            | 550    | 864                      | NR            | 680    | 486                      | NR            | 810    | 12                       | NR            | 940    | 0                        | NR            |
| 425    | 79                       | NR            | 555    | 872                      | NR            | 685    | 435                      | NR            | 815    | 10                       | NR            | 945    | 0                        | NR            |
| 430    | 147                      | NR            | 560    | 876                      | NR            | 690    | 389                      | NR            | 820    | 9                        | NR            | 950    | 0                        | NR            |
| 435    | 278                      | NR            | 565    | 883                      | NR            | 695    | 344                      | NR            | 825    | 7                        | NR            | 955    | 0                        | NR            |
| 440    | 515                      | NR            | 570    | 891                      | NR            | 700    | 303                      | NR            | 830    | 6                        | NR            | 960    | 0                        | NR            |
| 445    | 832                      | NR            | 575    | 900                      | NR            | 705    | 266                      | NR            | 835    | 5                        | NR            | 965    | 0                        | NR            |
| 450    | 874                      | NR            | 580    | 914                      | NR            | 710    | 233                      | NR            | 840    | 5                        | NR            | 970    | 0                        | NR            |
| 455    | 659                      | NR            | 585    | 927                      | NR            | 715    | 203                      | NR            | 845    | 4                        | NR            | 975    | 0                        | NR            |
| 460    | 567                      | NR            | 590    | 944                      | NR            | 720    | 178                      | NR            | 850    | 4                        | NR            | 980    | 0                        | NR            |
| 465    | 485                      | NR            | 595    | 961                      | NR            | 725    | 154                      | NR            | 855    | 3                        | NR            | 985    | 0                        | NR            |
| 470    | 401                      | NR            | 600    | 975                      | NR            | 730    | 133                      | NR            | 860    | 3                        | NR            | 990    | 0                        | NR            |
| 475    | 393                      | NR            | 605    | 988                      | NR            | 735    | 115                      | NR            | 865    | 2                        | NR            | 995    | 1                        | NR            |
| 480    | 417                      | NR            | 610    | 996                      | NR            | 740    | 98                       | NR            | 870    | 2                        | NR            | 1000   | 0                        | NR            |
| 485    | 448                      | NR            | 615    | 998                      | NR            | 745    | 85                       | NR            | 875    | 2                        | NR            |        |                          |               |

**Summary**

$R_f = 91.8$   
 $R_g = 98.4$   
 $CIE R_a = 92.1$   
 $R_9 = 60.7$



**Color Vector Graphics**

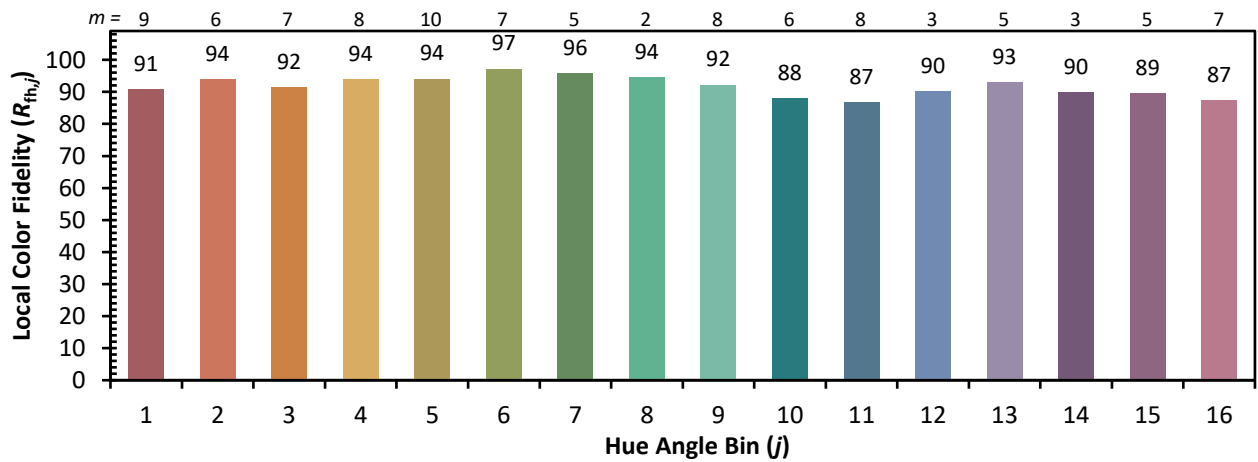
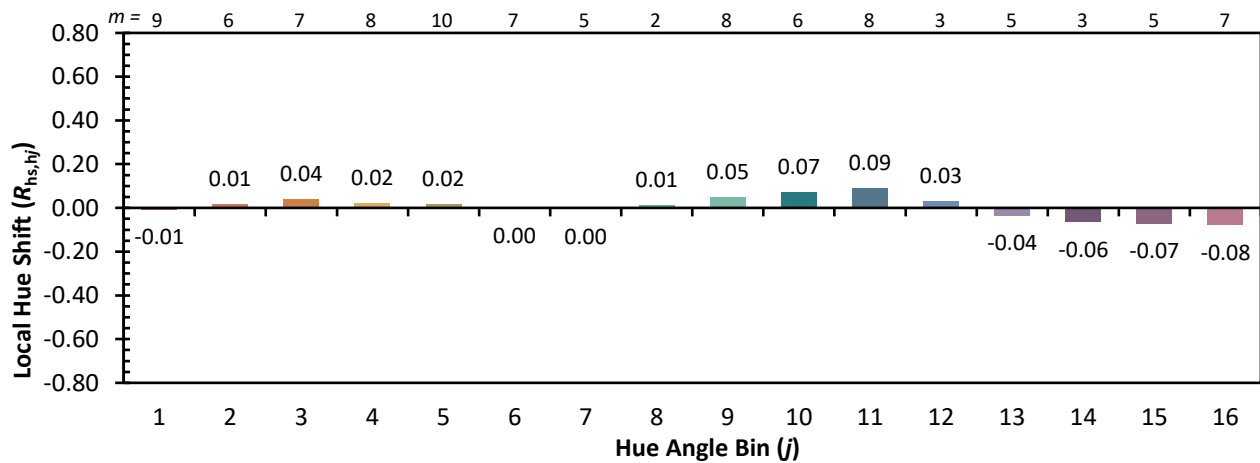
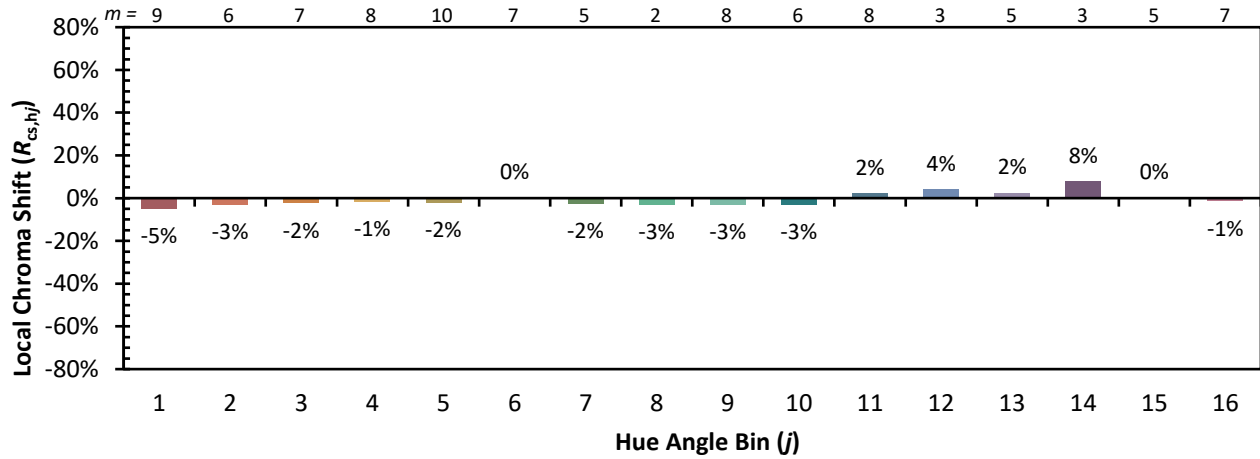


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 94 | CES51 = 96 | CES76 = 87 |
| CES02 = 62 | CES27 = 91 | CES52 = 98 | CES77 = 90 |
| CES03 = 31 | CES28 = 96 | CES53 = 95 | CES78 = 84 |
| CES04 = 69 | CES29 = 96 | CES54 = 94 | CES79 = 96 |
| CES05 = 49 | CES30 = 93 | CES55 = 92 | CES80 = 94 |
| CES06 = 50 | CES31 = 97 | CES56 = 93 | CES81 = 89 |
| CES07 = 42 | CES32 = 92 | CES57 = 92 | CES82 = 97 |
| CES08 = 41 | CES33 = 99 | CES58 = 92 | CES83 = 98 |
| CES09 = 29 | CES34 = 94 | CES59 = 96 | CES84 = 94 |
| CES10 = 74 | CES35 = 96 | CES60 = 93 | CES85 = 85 |
| CES11 = 57 | CES36 = 82 | CES61 = 92 | CES86 = 88 |
| CES12 = 63 | CES37 = 95 | CES62 = 87 | CES87 = 92 |
| CES13 = 43 | CES38 = 88 | CES63 = 92 | CES88 = 96 |
| CES14 = 74 | CES39 = 99 | CES64 = 89 | CES89 = 87 |
| CES15 = 71 | CES40 = 98 | CES65 = 88 | CES90 = 96 |
| CES16 = 47 | CES41 = 97 | CES66 = 87 | CES91 = 74 |
| CES17 = 49 | CES42 = 96 | CES67 = 86 | CES92 = 80 |
| CES18 = 56 | CES43 = 96 | CES68 = 88 | CES93 = 88 |
| CES19 = 71 | CES44 = 99 | CES69 = 89 | CES94 = 82 |
| CES20 = 66 | CES45 = 98 | CES70 = 86 | CES95 = 83 |
| CES21 = 85 | CES46 = 97 | CES71 = 81 | CES96 = 92 |
| CES22 = 78 | CES47 = 97 | CES72 = 94 | CES97 = 95 |
| CES23 = 91 | CES48 = 91 | CES73 = 81 | CES98 = 94 |
| CES24 = 90 | CES49 = 96 | CES74 = 93 | CES99 = 91 |
| CES25 = 71 | CES50 = 97 | CES75 = 83 |            |



Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)