

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: P1457966

Luminaire Tested: GLAN-SB4D-930-U-T2LG-HSS

Issue Date: 05/20/2026

**Test Information**

Test Method: LM-79-2024  
Report Number: P1457966  
Test Lab: INNOVATION CENTER(G1)  
Issue Date: 5/22/2026  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: STREETWORKS  
Catalog Number: GLAN-SB4D-930-U-T2LG-HSS  
Description: GALLEON II AREA AND ROADWAY HIGH DENSITY LUMINAIRE 900mA 4xLight Square PACKAGE 90CRI 3000K FIXTURE w/ TYPE II LOW GLARE WITH HOUSE SIDE SHIELD  
Light Source: (104) 3000K CCT, 90 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

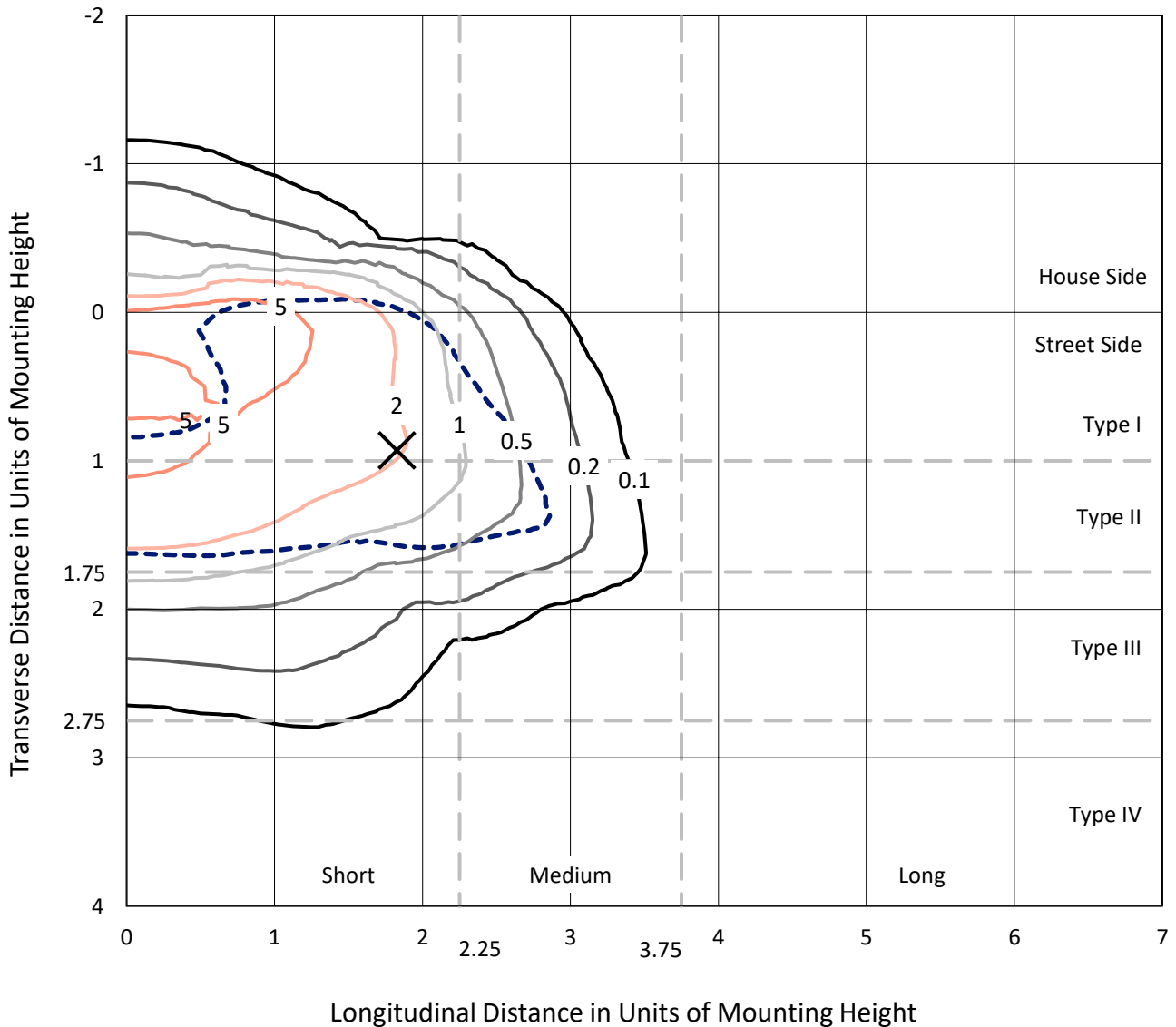
Lumens per Lamp: N/A  
Luminaire Lumens: 20565.1 lumens  
Efficiency: N/A  
Efficacy: 70.0 lumens/watt  
Luminous Opening: Rectangular (W 1' x L: 1' x H: 0')  
IES Classification: Type II - Short  
BUG Rating: B2 - U0 - G2

Input Watts (W): 293.6  
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

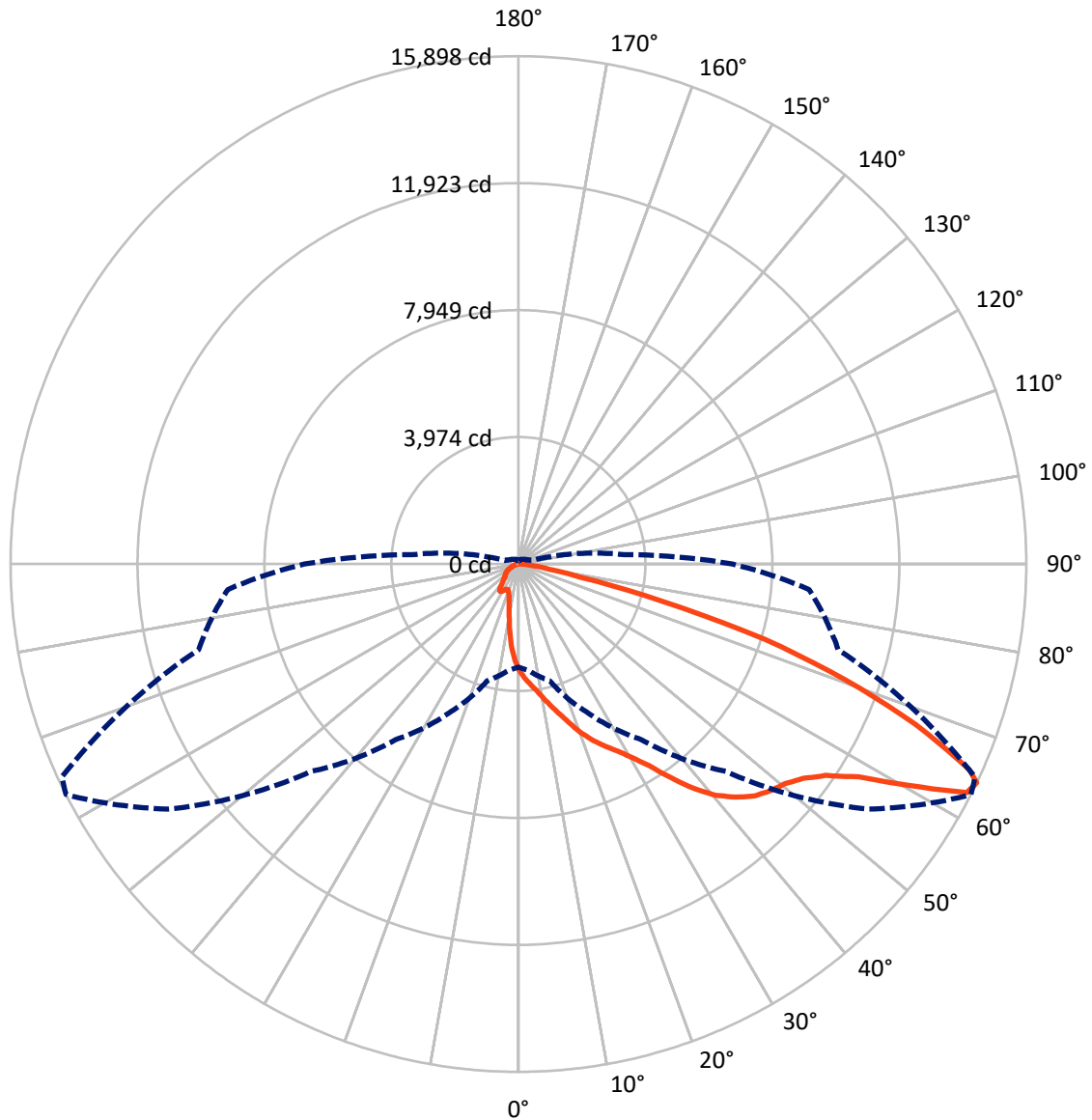
× Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 9.4 fc  
 Type II - Short - N/A

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### Luminous Intensity Polar Plot



— Vertical Plane Through 63-Deg Lateral    - - - Horizontal Cone Through 64-Deg Vertical

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**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 2440.4   | 0.0    | 2440.4  |
|                    | % Fixture | 11.9     | 0.0    | 11.9    |
| <b>Street Side</b> | Lumens    | 18124.6  | 0.0    | 18124.6 |
|                    | % Fixture | 88.1     | 0.0    | 88.1    |
| <b>Total</b>       | Lumens    | 20565.1  | 0.0    | 20565.1 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 280.0   | 1.4       |
| 10°-20°   | 786.9   | 3.8       |
| 20°-30°   | 1401.4  | 6.8       |
| 30°-40°   | 2676.7  | 13.0      |
| 40°-50°   | 4436.8  | 21.6      |
| 50°-60°   | 5530.5  | 26.9      |
| 60°-70°   | 4123.9  | 20.1      |
| 70°-80°   | 1182.7  | 5.8       |
| 80°-90°   | 146.2   | 0.7       |
| 90°-100°  | 0.0     | 0.0       |
| 100°-110° | 0.0     | 0.0       |
| 110°-120° | 0.0     | 0.0       |
| 120°-130° | 0.0     | 0.0       |
| 130°-140° | 0.0     | 0.0       |
| 140°-150° | 0.0     | 0.0       |
| 150°-160° | 0.0     | 0.0       |
| 160°-170° | 0.0     | 0.0       |
| 170°-180° | 0.0     | 0.0       |
| 0°-90°    | 20565.1 | 100.0     |
| 0°-180°   | 20565.1 | 100.0     |

**Coefficient of Utilization**



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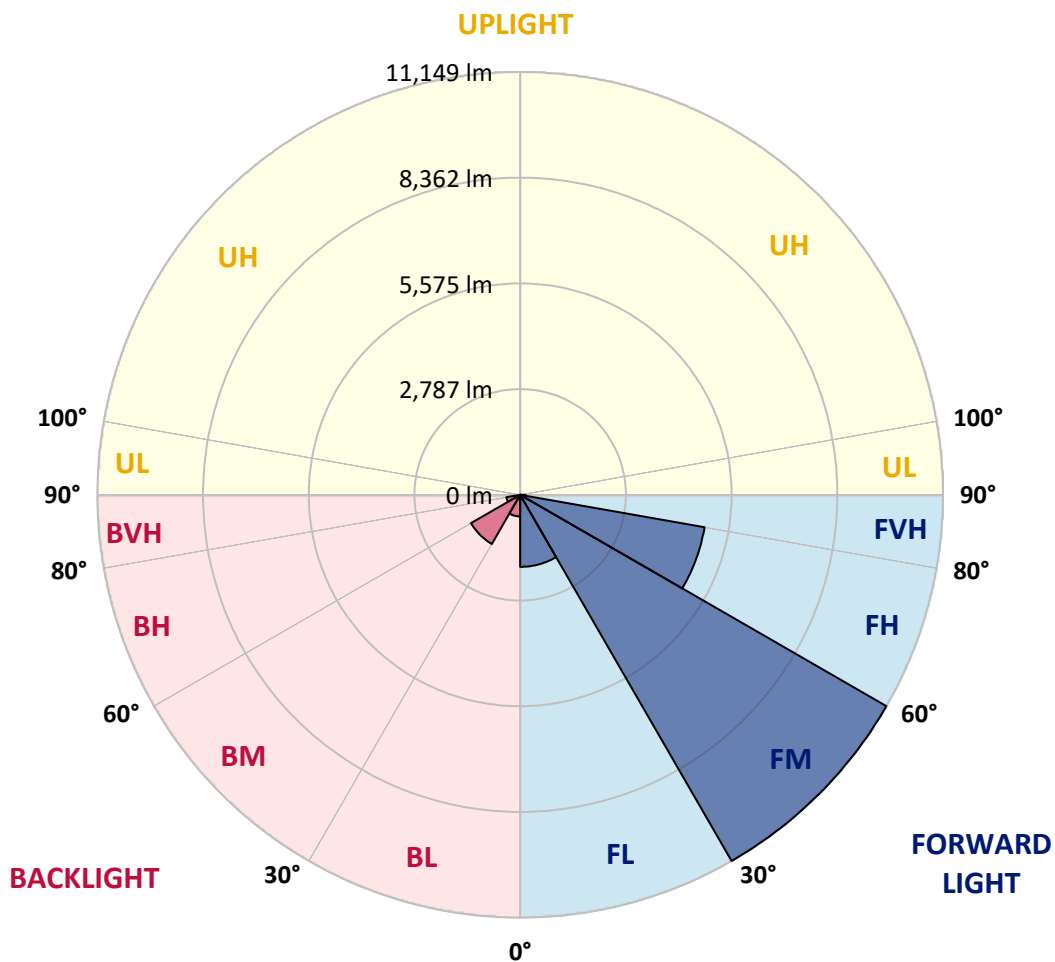
CATALOG NUMBER: GLAN-SB4D-930-U-T2LG-HSS

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

| Zone           | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |         |
|----------------|---------|-----------|-------------------------|------|---------|
|                |         |           | B                       | U    | G       |
| FL (0°-30°)    | 1898.9  | 9.2       |                         |      |         |
| FM (30°-60°)   | 11149.2 | 54.2      |                         |      |         |
| FH (60°-80°)   | 4937.5  | 24.0      |                         |      | G2/5000 |
| FVH (80°-90°)  | 139.1   | 0.7       |                         |      | G2/225  |
| BL (0°-30°)    | 569.4   | 2.8       | B2/1000                 |      |         |
| BM (30°-60°)   | 1494.8  | 7.3       | B2/2500                 |      |         |
| BH (60°-80°)   | 369.1   | 1.8       | B1/500                  |      | G1/500  |
| BVH (80°-90°)  | 7.2     | 0.0       |                         |      | G0/10   |
| UL (90°-100°)  | 0.0     | 0.0       |                         | U0/0 |         |
| UH (100°-180°) | 0.0     | 0.0       |                         | U0/0 |         |

**BUG Rating: B2-U0-G2**

Type II Short





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 45°     | 55°     | 63°     | 65°     | 75°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 3325.1  | 3325.1  | 3325.1  | 3325.1  | 3325.1  | 3325.1  | 3325.1  | 3325.1  | 3325.1  | 3325.1  | 3325.1  |
| 2.5°  | 3726.1  | 3713.8  | 3701.4  | 3682.9  | 3658.3  | 3633.6  | 3602.7  | 3559.5  | 3541.0  | 3479.4  | 3405.3  |
| 5°    | 3917.4  | 3917.4  | 3911.2  | 3898.8  | 3886.5  | 3861.8  | 3824.8  | 3769.3  | 3744.6  | 3658.3  | 3528.7  |
| 7.5°  | 3966.7  | 3972.9  | 3991.4  | 4016.1  | 4053.1  | 4046.9  | 4046.9  | 3985.2  | 3972.9  | 3880.3  | 3707.6  |
| 10°   | 3880.3  | 3886.5  | 3935.9  | 4003.7  | 4114.8  | 4219.6  | 4293.7  | 4256.7  | 4238.1  | 4145.6  | 3929.7  |
| 12.5° | 3757.0  | 3757.0  | 3837.2  | 3942.0  | 4114.8  | 4312.2  | 4528.1  | 4565.1  | 4571.3  | 4466.4  | 4207.3  |
| 15°   | 3436.2  | 3448.5  | 3578.1  | 3787.8  | 4071.6  | 4380.0  | 4744.0  | 4885.9  | 4922.9  | 4855.1  | 4546.6  |
| 17.5° | 3010.5  | 3022.8  | 3152.4  | 3436.2  | 3861.8  | 4380.0  | 4929.1  | 5256.0  | 5305.4  | 5317.7  | 4978.4  |
| 20°   | 2831.6  | 2831.6  | 2905.6  | 3121.5  | 3565.7  | 4262.8  | 5040.1  | 5650.9  | 5761.9  | 5897.6  | 5453.5  |
| 22.5° | 2856.3  | 2856.3  | 2899.5  | 3022.8  | 3380.6  | 4102.4  | 5108.0  | 6002.5  | 6230.8  | 6576.2  | 6064.2  |
| 25°   | 2992.0  | 2992.0  | 3029.0  | 3109.2  | 3399.2  | 4077.8  | 5237.5  | 6317.1  | 6681.1  | 7335.0  | 6761.3  |
| 27.5° | 3207.9  | 3201.7  | 3232.6  | 3312.8  | 3578.1  | 4195.0  | 5453.5  | 6631.7  | 7038.9  | 8186.3  | 7563.3  |
| 30°   | 3522.5  | 3504.0  | 3516.4  | 3608.9  | 3868.0  | 4466.4  | 5768.1  | 7032.7  | 7446.1  | 9117.9  | 8451.6  |
| 32.5° | 4250.5  | 4244.3  | 4065.4  | 4016.1  | 4293.7  | 4904.4  | 6199.9  | 7532.4  | 7995.1  | 10104.9 | 9364.6  |
| 35°   | 5564.5  | 5650.9  | 5397.9  | 4750.2  | 4805.7  | 5490.5  | 6816.8  | 8211.0  | 8636.7  | 11153.7 | 10357.9 |
| 37.5° | 6897.0  | 6897.0  | 6792.1  | 6027.2  | 5638.5  | 6138.2  | 7483.1  | 8908.1  | 9352.3  | 11998.8 | 11314.1 |
| 40°   | 7951.9  | 8007.4  | 7884.1  | 7310.3  | 6804.5  | 6878.5  | 8149.3  | 9518.9  | 9926.0  | 12517.0 | 11992.7 |
| 42.5° | 8735.4  | 8723.1  | 8673.7  | 8297.4  | 8013.6  | 7847.0  | 8753.9  | 9975.4  | 10364.0 | 12782.3 | 12418.3 |
| 45°   | 9580.6  | 9580.6  | 9512.7  | 9204.2  | 8969.8  | 8827.9  | 9204.2  | 10357.9 | 10765.0 | 12942.7 | 12683.6 |
| 47.5° | 10462.7 | 10450.4 | 10382.5 | 10043.2 | 9790.3  | 9580.6  | 9660.8  | 10604.6 | 11011.8 | 12837.8 | 12726.8 |
| 50°   | 10678.6 | 10666.3 | 10820.5 | 10832.9 | 10604.6 | 10203.6 | 10024.7 | 10814.4 | 11172.2 | 12844.0 | 12862.5 |
| 52.5° | 10425.7 | 10499.7 | 10728.0 | 11005.6 | 11264.7 | 10845.2 | 10413.4 | 11147.5 | 11517.6 | 13016.7 | 13201.8 |
| 55°   | 9796.5  | 9827.3  | 10265.3 | 10709.5 | 11314.1 | 11462.1 | 11036.5 | 11678.0 | 12005.0 | 13183.3 | 13504.1 |
| 57.5° | 8624.3  | 8741.6  | 9210.4  | 9981.5  | 10900.7 | 11517.6 | 12122.2 | 12566.4 | 12813.1 | 13251.1 | 13337.5 |
| 60°   | 6508.4  | 6570.1  | 7587.9  | 8587.3  | 10043.2 | 11073.5 | 13133.9 | 14071.6 | 14040.8 | 12486.2 | 12171.6 |
| 62.5° | 3960.5  | 4016.1  | 4744.0  | 6329.5  | 8161.7  | 10148.1 | 13473.2 | 15755.8 | 15589.2 | 11196.8 | 10246.8 |
| 64°   | 3226.4  | 3331.3  | 3781.6  | 5138.8  | 6711.9  | 9179.6  | 13374.5 | 15897.7 | 15768.1 | 10364.0 | 9130.2  |
| 65°   | 2757.6  | 2899.5  | 3362.1  | 4460.2  | 5706.4  | 8137.0  | 13103.1 | 15502.9 | 15416.5 | 9858.2  | 8204.9  |
| 67.5° | 1733.5  | 1801.4  | 2486.1  | 3467.0  | 3929.7  | 5206.7  | 11264.7 | 13405.4 | 13559.6 | 8784.7  | 6051.9  |
| 70°   | 1289.3  | 1320.2  | 1708.8  | 2683.5  | 3066.0  | 3029.0  | 7736.0  | 10857.5 | 10894.6 | 7026.6  | 3652.1  |
| 72.5° | 937.7   | 943.9   | 1196.8  | 1986.4  | 2399.8  | 2066.6  | 4077.8  | 8069.1  | 7803.9  | 4114.8  | 1992.6  |
| 75°   | 623.1   | 647.8   | 839.0   | 1400.4  | 1869.2  | 1517.6  | 1856.9  | 4596.0  | 4515.8  | 2011.1  | 1141.3  |
| 77.5° | 456.5   | 462.7   | 567.6   | 937.7   | 1468.2  | 1116.6  | 1122.8  | 1980.3  | 2042.0  | 1196.8  | 721.8   |
| 80°   | 259.1   | 271.4   | 370.1   | 573.7   | 956.2   | 765.0   | 629.2   | 956.2   | 1098.1  | 814.3   | 481.2   |
| 82.5° | 154.2   | 166.6   | 265.3   | 376.3   | 653.9   | 314.6   | 320.8   | 524.4   | 653.9   | 586.1   | 259.1   |
| 85°   | 92.5    | 98.7    | 166.6   | 203.6   | 388.7   | 209.7   | 117.2   | 259.1   | 339.3   | 345.5   | 141.9   |
| 87.5° | 61.7    | 61.7    | 92.5    | 86.4    | 111.0   | 98.7    | 49.4    | 67.9    | 86.4    | 117.2   | 55.5    |
| 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: P1457966

CATALOG NUMBER: GLAN-SB4D-930-U-T2LG-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°     | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 3325.1  | 3325.1 | 3325.1 | 3325.1 | 3325.1 | 3325.1 | 3325.1 | 3325.1 | 3325.1 | 3325.1 | 3325.1 |
| 2.5°  | 3343.6  | 3306.6 | 3195.6 | 3047.5 | 2911.8 | 2806.9 | 2677.4 | 2591.0 | 2510.8 | 2510.8 | 2442.9 |
| 5°    | 3423.8  | 3325.1 | 3053.7 | 2714.4 | 2350.4 | 2004.9 | 1782.9 | 1536.1 | 1455.9 | 1388.0 | 1400.4 |
| 7.5°  | 3559.5  | 3380.6 | 2899.5 | 2288.7 | 1708.8 | 1338.7 | 1091.9 | 980.9  | 931.5  | 900.7  | 906.9  |
| 10°   | 3726.1  | 3479.4 | 2714.4 | 1856.9 | 1258.5 | 980.9  | 863.7  | 820.5  | 802.0  | 795.8  | 795.8  |
| 12.5° | 3954.4  | 3596.6 | 2529.3 | 1492.9 | 993.2  | 845.2  | 783.5  | 758.8  | 740.3  | 727.9  | 727.9  |
| 15°   | 4225.8  | 3744.6 | 2313.4 | 1227.6 | 869.8  | 777.3  | 727.9  | 703.3  | 678.6  | 672.4  | 672.4  |
| 17.5° | 4571.3  | 3898.8 | 2122.2 | 1054.9 | 808.1  | 727.9  | 678.6  | 647.8  | 629.2  | 623.1  | 623.1  |
| 20°   | 4953.8  | 4090.1 | 1930.9 | 956.2  | 765.0  | 678.6  | 629.2  | 604.6  | 586.1  | 573.7  | 579.9  |
| 22.5° | 5441.1  | 4330.7 | 1807.5 | 906.9  | 727.9  | 635.4  | 586.1  | 561.4  | 542.9  | 530.5  | 536.7  |
| 25°   | 5977.8  | 4633.0 | 1739.7 | 906.9  | 703.3  | 604.6  | 549.0  | 524.4  | 505.9  | 493.5  | 493.5  |
| 27.5° | 6631.7  | 4972.3 | 1745.8 | 943.9  | 697.1  | 579.9  | 518.2  | 493.5  | 475.0  | 456.5  | 456.5  |
| 30°   | 7353.5  | 5373.3 | 1813.7 | 1011.7 | 709.4  | 555.2  | 493.5  | 456.5  | 444.2  | 425.7  | 425.7  |
| 32.5° | 8118.5  | 5835.9 | 1986.4 | 1098.1 | 697.1  | 524.4  | 456.5  | 425.7  | 407.2  | 394.8  | 394.8  |
| 35°   | 8926.6  | 6360.3 | 2202.4 | 1135.1 | 635.4  | 481.2  | 425.7  | 394.8  | 382.5  | 376.3  | 370.1  |
| 37.5° | 9697.8  | 6816.8 | 2319.6 | 1061.1 | 555.2  | 444.2  | 388.7  | 357.8  | 351.6  | 339.3  | 339.3  |
| 40°   | 10296.2 | 7193.1 | 2251.7 | 906.9  | 512.0  | 407.2  | 357.8  | 327.0  | 314.6  | 302.3  | 302.3  |
| 42.5° | 10647.8 | 7328.8 | 2004.9 | 771.1  | 481.2  | 370.1  | 327.0  | 296.1  | 283.8  | 277.6  | 277.6  |
| 45°   | 10851.4 | 7310.3 | 1715.0 | 690.9  | 450.3  | 339.3  | 296.1  | 277.6  | 259.1  | 252.9  | 246.8  |
| 47.5° | 10845.2 | 7119.1 | 1505.3 | 623.1  | 419.5  | 314.6  | 277.6  | 259.1  | 240.6  | 234.4  | 234.4  |
| 50°   | 10802.0 | 6835.3 | 1270.8 | 573.7  | 394.8  | 296.1  | 259.1  | 246.8  | 228.3  | 222.1  | 215.9  |
| 52.5° | 10906.9 | 6674.9 | 1061.1 | 542.9  | 364.0  | 283.8  | 252.9  | 234.4  | 209.7  | 203.6  | 203.6  |
| 55°   | 11036.5 | 6582.4 | 851.3  | 512.0  | 339.3  | 277.6  | 240.6  | 222.1  | 197.4  | 191.2  | 191.2  |
| 57.5° | 10660.1 | 6230.8 | 703.3  | 462.7  | 308.5  | 265.3  | 228.3  | 215.9  | 191.2  | 172.7  | 172.7  |
| 60°   | 9475.7  | 5151.2 | 579.9  | 407.2  | 283.8  | 246.8  | 215.9  | 197.4  | 172.7  | 148.1  | 148.1  |
| 62.5° | 7705.2  | 3929.7 | 481.2  | 345.5  | 265.3  | 228.3  | 197.4  | 178.9  | 148.1  | 117.2  | 117.2  |
| 64°   | 6693.4  | 3337.5 | 431.8  | 302.3  | 252.9  | 209.7  | 178.9  | 160.4  | 129.6  | 98.7   | 92.5   |
| 65°   | 6002.5  | 2948.8 | 401.0  | 283.8  | 246.8  | 197.4  | 172.7  | 154.2  | 117.2  | 92.5   | 86.4   |
| 67.5° | 4225.8  | 1980.3 | 320.8  | 234.4  | 215.9  | 166.6  | 148.1  | 129.6  | 104.9  | 80.2   | 74.0   |
| 70°   | 2461.5  | 1122.8 | 252.9  | 197.4  | 166.6  | 129.6  | 123.4  | 117.2  | 92.5   | 61.7   | 61.7   |
| 72.5° | 1338.7  | 561.4  | 191.2  | 160.4  | 129.6  | 92.5   | 104.9  | 92.5   | 74.0   | 49.4   | 43.2   |
| 75°   | 820.5   | 345.5  | 141.9  | 117.2  | 86.4   | 67.9   | 80.2   | 67.9   | 43.2   | 30.8   | 24.7   |
| 77.5° | 549.0   | 222.1  | 104.9  | 80.2   | 55.5   | 43.2   | 55.5   | 37.0   | 18.5   | 6.2    | 6.2    |
| 80°   | 339.3   | 154.2  | 67.9   | 49.4   | 30.8   | 18.5   | 12.3   | 6.2    | 6.2    | 0.0    | 0.0    |
| 82.5° | 148.1   | 98.7   | 37.0   | 24.7   | 12.3   | 6.2    | 6.2    | 0.0    | 0.0    | 0.0    | 0.0    |
| 85°   | 80.2    | 30.8   | 12.3   | 6.2    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 87.5° | 24.7    | 12.3   | 6.2    | 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    |

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: SP1-2407-184-14

Test Date: 10/11/2024

Luminaire Tested: GSS-SB1A-930-U-5WQ

Data in this report applies to families of products including GSS-SB1A-930-U-5WQ

**Test Information**

Test Method: LM-79-2019  
 Report Number: SP1-2407-184-14  
 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-930-U-5WQ**  
 Description: GALLEON II SITE SLIM 1SQ 350MA 5WQ HIGH DENSITY LIGHTSQUARE WITH 90 CRI 3000K CCT 26 LEDS

**Spectral Parameters**

CCT (K): 2993  
 CIE u': 0.2501  
 CIE v': 0.5245  
 Duv: 0.0021  
 CIE x: 0.4406  
 CIE y: 0.4107  
 CIE z: 0.1487  
 Peak Wavelength (nm): 621  
 Dominant Wavelength (nm): 582  
 Purity: 55.53327  
 Rf: 92.6  
 Rg: 98.5

|           |      |      |      |
|-----------|------|------|------|
| CRI (Ra): | 92.4 |      |      |
| R1:       | 92.2 | R9:  | 58.2 |
| R2:       | 95.2 | R10: | 87.7 |
| R3:       | 97.0 | R11: | 93.5 |
| R4:       | 93.1 | R12: | 81.7 |
| R5:       | 91.7 | R13: | 92.9 |
| R6:       | 94.2 | R14: | 97.6 |
| R7:       | 93.3 | R15: | 88.1 |
| R8:       | 82.3 |      |      |



**Test Conditions**

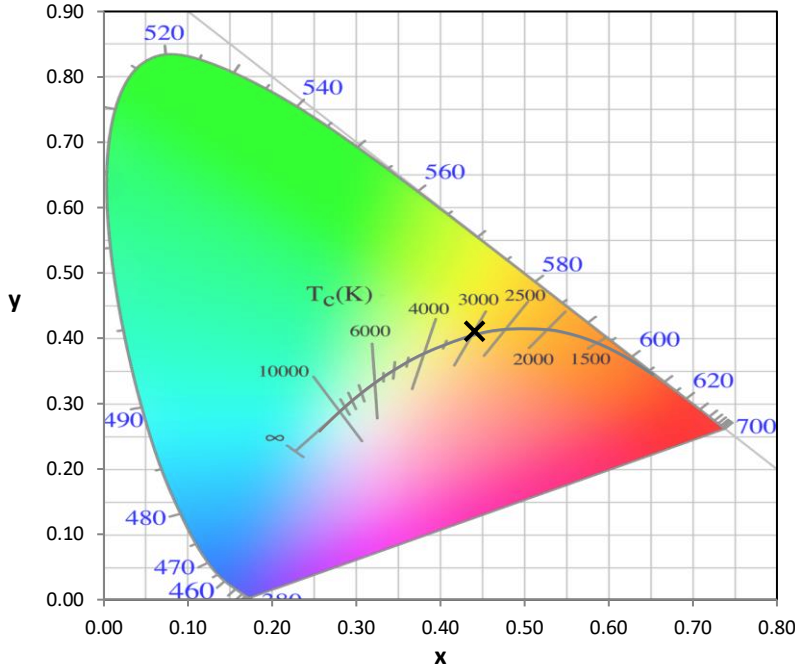
Stabilization Time: 20M  
 Operation Time: 1H 20M  
 Sphere Temperature (°C): 25.2

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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 = 2993K  
 CIE x = 0.4406  
 CIE y = 0.4107  
 Duv = 0.0021

Point lies inside the ANSI 3000K 4-step quadrangle

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**Photopic Flux vs. Wavelength**



**Photopic Lumens: NR**

| $\lambda$ (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            | 310                      | NR                   | 620            | 998                      | NR                   | 750            | 77                       | NR                   | 880            | 2                        | NR                   |
| 365            | 0                        | NR                   | 495            | 347                      | NR                   | 625            | 993                      | NR                   | 755            | 66                       | NR                   | 885            | 1                        | NR                   |
| 370            | 0                        | NR                   | 500            | 379                      | NR                   | 630            | 983                      | NR                   | 760            | 56                       | NR                   | 890            | 1                        | NR                   |
| 375            | 0                        | NR                   | 505            | 412                      | NR                   | 635            | 960                      | NR                   | 765            | 48                       | NR                   | 895            | 1                        | NR                   |
| 380            | 0                        | NR                   | 510            | 442                      | NR                   | 640            | 930                      | NR                   | 770            | 41                       | NR                   | 900            | 1                        | NR                   |
| 385            | 0                        | NR                   | 515            | 475                      | NR                   | 645            | 889                      | NR                   | 775            | 35                       | NR                   | 905            | 1                        | NR                   |
| 390            | 0                        | NR                   | 520            | 506                      | NR                   | 650            | 846                      | NR                   | 780            | 30                       | NR                   | 910            | 1                        | NR                   |
| 395            | 0                        | NR                   | 525            | 535                      | NR                   | 655            | 794                      | NR                   | 785            | 26                       | NR                   | 915            | 1                        | NR                   |
| 400            | 1                        | NR                   | 530            | 565                      | NR                   | 660            | 740                      | NR                   | 790            | 22                       | NR                   | 920            | 1                        | NR                   |
| 405            | 2                        | NR                   | 535            | 592                      | NR                   | 665            | 684                      | NR                   | 795            | 19                       | NR                   | 925            | 1                        | NR                   |
| 410            | 6                        | NR                   | 540            | 615                      | NR                   | 670            | 624                      | NR                   | 800            | 16                       | NR                   | 930            | 0                        | NR                   |
| 415            | 10                       | NR                   | 545            | 638                      | NR                   | 675            | 567                      | NR                   | 805            | 14                       | NR                   | 935            | 0                        | NR                   |
| 420            | 20                       | NR                   | 550            | 658                      | NR                   | 680            | 513                      | NR                   | 810            | 12                       | NR                   | 940            | 0                        | NR                   |
| 425            | 38                       | NR                   | 555            | 678                      | NR                   | 685            | 459                      | NR                   | 815            | 10                       | NR                   | 945            | 0                        | NR                   |
| 430            | 70                       | NR                   | 560            | 695                      | NR                   | 690            | 412                      | NR                   | 820            | 9                        | NR                   | 950            | 0                        | NR                   |
| 435            | 136                      | NR                   | 565            | 716                      | NR                   | 695            | 363                      | NR                   | 825            | 8                        | NR                   | 955            | 0                        | NR                   |
| 440            | 262                      | NR                   | 570            | 740                      | NR                   | 700            | 320                      | NR                   | 830            | 7                        | NR                   | 960            | 0                        | NR                   |
| 445            | 424                      | NR                   | 575            | 765                      | NR                   | 705            | 281                      | NR                   | 835            | 6                        | NR                   | 965            | 0                        | NR                   |
| 450            | 406                      | NR                   | 580            | 796                      | NR                   | 710            | 245                      | NR                   | 840            | 5                        | NR                   | 970            | 0                        | NR                   |
| 455            | 313                      | NR                   | 585            | 827                      | NR                   | 715            | 215                      | NR                   | 845            | 4                        | NR                   | 975            | 0                        | NR                   |
| 460            | 294                      | NR                   | 590            | 861                      | NR                   | 720            | 188                      | NR                   | 850            | 4                        | NR                   | 980            | 0                        | NR                   |
| 465            | 250                      | NR                   | 595            | 894                      | NR                   | 725            | 162                      | NR                   | 855            | 3                        | NR                   | 985            | 0                        | NR                   |
| 470            | 217                      | NR                   | 600            | 927                      | NR                   | 730            | 140                      | NR                   | 860            | 3                        | NR                   | 990            | 0                        | NR                   |
| 475            | 228                      | NR                   | 605            | 954                      | NR                   | 735            | 121                      | NR                   | 865            | 2                        | NR                   | 995            | 0                        | NR                   |
| 480            | 249                      | NR                   | 610            | 976                      | NR                   | 740            | 104                      | NR                   | 870            | 2                        | NR                   | 1000           | 0                        | NR                   |
| 485            | 276                      | NR                   | 615            | 992                      | NR                   | 745            | 89                       | NR                   | 875            | 2                        | NR                   |                |                          |                      |

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**Scotopic Flux vs. Wavelength**



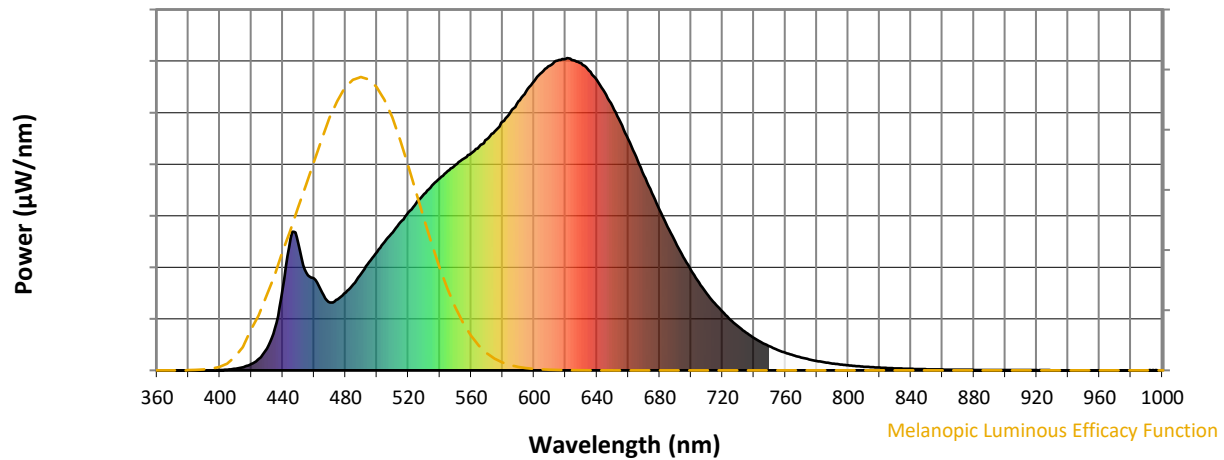
**Scotopic Lumens: NR**

**S/P: 1.39**

| $\lambda$ (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            | 310                      | NR                   | 620            | 998                      | NR                   | 750            | 77                       | NR                   | 880            | 2                        | NR                   |
| 365            | 0                        | NR                   | 495            | 347                      | NR                   | 625            | 993                      | NR                   | 755            | 66                       | NR                   | 885            | 1                        | NR                   |
| 370            | 0                        | NR                   | 500            | 379                      | NR                   | 630            | 983                      | NR                   | 760            | 56                       | NR                   | 890            | 1                        | NR                   |
| 375            | 0                        | NR                   | 505            | 412                      | NR                   | 635            | 960                      | NR                   | 765            | 48                       | NR                   | 895            | 1                        | NR                   |
| 380            | 0                        | NR                   | 510            | 442                      | NR                   | 640            | 930                      | NR                   | 770            | 41                       | NR                   | 900            | 1                        | NR                   |
| 385            | 0                        | NR                   | 515            | 475                      | NR                   | 645            | 889                      | NR                   | 775            | 35                       | NR                   | 905            | 1                        | NR                   |
| 390            | 0                        | NR                   | 520            | 506                      | NR                   | 650            | 846                      | NR                   | 780            | 30                       | NR                   | 910            | 1                        | NR                   |
| 395            | 0                        | NR                   | 525            | 535                      | NR                   | 655            | 794                      | NR                   | 785            | 26                       | NR                   | 915            | 1                        | NR                   |
| 400            | 1                        | NR                   | 530            | 565                      | NR                   | 660            | 740                      | NR                   | 790            | 22                       | NR                   | 920            | 1                        | NR                   |
| 405            | 2                        | NR                   | 535            | 592                      | NR                   | 665            | 684                      | NR                   | 795            | 19                       | NR                   | 925            | 1                        | NR                   |
| 410            | 6                        | NR                   | 540            | 615                      | NR                   | 670            | 624                      | NR                   | 800            | 16                       | NR                   | 930            | 0                        | NR                   |
| 415            | 10                       | NR                   | 545            | 638                      | NR                   | 675            | 567                      | NR                   | 805            | 14                       | NR                   | 935            | 0                        | NR                   |
| 420            | 20                       | NR                   | 550            | 658                      | NR                   | 680            | 513                      | NR                   | 810            | 12                       | NR                   | 940            | 0                        | NR                   |
| 425            | 38                       | NR                   | 555            | 678                      | NR                   | 685            | 459                      | NR                   | 815            | 10                       | NR                   | 945            | 0                        | NR                   |
| 430            | 70                       | NR                   | 560            | 695                      | NR                   | 690            | 412                      | NR                   | 820            | 9                        | NR                   | 950            | 0                        | NR                   |
| 435            | 136                      | NR                   | 565            | 716                      | NR                   | 695            | 363                      | NR                   | 825            | 8                        | NR                   | 955            | 0                        | NR                   |
| 440            | 262                      | NR                   | 570            | 740                      | NR                   | 700            | 320                      | NR                   | 830            | 7                        | NR                   | 960            | 0                        | NR                   |
| 445            | 424                      | NR                   | 575            | 765                      | NR                   | 705            | 281                      | NR                   | 835            | 6                        | NR                   | 965            | 0                        | NR                   |
| 450            | 406                      | NR                   | 580            | 796                      | NR                   | 710            | 245                      | NR                   | 840            | 5                        | NR                   | 970            | 0                        | NR                   |
| 455            | 313                      | NR                   | 585            | 827                      | NR                   | 715            | 215                      | NR                   | 845            | 4                        | NR                   | 975            | 0                        | NR                   |
| 460            | 294                      | NR                   | 590            | 861                      | NR                   | 720            | 188                      | NR                   | 850            | 4                        | NR                   | 980            | 0                        | NR                   |
| 465            | 250                      | NR                   | 595            | 894                      | NR                   | 725            | 162                      | NR                   | 855            | 3                        | NR                   | 985            | 0                        | NR                   |
| 470            | 217                      | NR                   | 600            | 927                      | NR                   | 730            | 140                      | NR                   | 860            | 3                        | NR                   | 990            | 0                        | NR                   |
| 475            | 228                      | NR                   | 605            | 954                      | NR                   | 735            | 121                      | NR                   | 865            | 2                        | NR                   | 995            | 0                        | NR                   |
| 480            | 249                      | NR                   | 610            | 976                      | NR                   | 740            | 104                      | NR                   | 870            | 2                        | NR                   | 1000           | 0                        | NR                   |
| 485            | 276                      | NR                   | 615            | 992                      | NR                   | 745            | 89                       | NR                   | 875            | 2                        | NR                   |                |                          |                      |

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Melanopic Flux vs. Wavelength



Melanopic Lumens: NR

M/P: 2.69

| 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    | 310                      | NR            | 620    | 998                      | NR            | 750    | 77                       | NR            | 880    | 2                        | NR            |
| 365    | 0                        | NR            | 495    | 347                      | NR            | 625    | 993                      | NR            | 755    | 66                       | NR            | 885    | 1                        | NR            |
| 370    | 0                        | NR            | 500    | 379                      | NR            | 630    | 983                      | NR            | 760    | 56                       | NR            | 890    | 1                        | NR            |
| 375    | 0                        | NR            | 505    | 412                      | NR            | 635    | 960                      | NR            | 765    | 48                       | NR            | 895    | 1                        | NR            |
| 380    | 0                        | NR            | 510    | 442                      | NR            | 640    | 930                      | NR            | 770    | 41                       | NR            | 900    | 1                        | NR            |
| 385    | 0                        | NR            | 515    | 475                      | NR            | 645    | 889                      | NR            | 775    | 35                       | NR            | 905    | 1                        | NR            |
| 390    | 0                        | NR            | 520    | 506                      | NR            | 650    | 846                      | NR            | 780    | 30                       | NR            | 910    | 1                        | NR            |
| 395    | 0                        | NR            | 525    | 535                      | NR            | 655    | 794                      | NR            | 785    | 26                       | NR            | 915    | 1                        | NR            |
| 400    | 1                        | NR            | 530    | 565                      | NR            | 660    | 740                      | NR            | 790    | 22                       | NR            | 920    | 1                        | NR            |
| 405    | 2                        | NR            | 535    | 592                      | NR            | 665    | 684                      | NR            | 795    | 19                       | NR            | 925    | 1                        | NR            |
| 410    | 6                        | NR            | 540    | 615                      | NR            | 670    | 624                      | NR            | 800    | 16                       | NR            | 930    | 0                        | NR            |
| 415    | 10                       | NR            | 545    | 638                      | NR            | 675    | 567                      | NR            | 805    | 14                       | NR            | 935    | 0                        | NR            |
| 420    | 20                       | NR            | 550    | 658                      | NR            | 680    | 513                      | NR            | 810    | 12                       | NR            | 940    | 0                        | NR            |
| 425    | 38                       | NR            | 555    | 678                      | NR            | 685    | 459                      | NR            | 815    | 10                       | NR            | 945    | 0                        | NR            |
| 430    | 70                       | NR            | 560    | 695                      | NR            | 690    | 412                      | NR            | 820    | 9                        | NR            | 950    | 0                        | NR            |
| 435    | 136                      | NR            | 565    | 716                      | NR            | 695    | 363                      | NR            | 825    | 8                        | NR            | 955    | 0                        | NR            |
| 440    | 262                      | NR            | 570    | 740                      | NR            | 700    | 320                      | NR            | 830    | 7                        | NR            | 960    | 0                        | NR            |
| 445    | 424                      | NR            | 575    | 765                      | NR            | 705    | 281                      | NR            | 835    | 6                        | NR            | 965    | 0                        | NR            |
| 450    | 406                      | NR            | 580    | 796                      | NR            | 710    | 245                      | NR            | 840    | 5                        | NR            | 970    | 0                        | NR            |
| 455    | 313                      | NR            | 585    | 827                      | NR            | 715    | 215                      | NR            | 845    | 4                        | NR            | 975    | 0                        | NR            |
| 460    | 294                      | NR            | 590    | 861                      | NR            | 720    | 188                      | NR            | 850    | 4                        | NR            | 980    | 0                        | NR            |
| 465    | 250                      | NR            | 595    | 894                      | NR            | 725    | 162                      | NR            | 855    | 3                        | NR            | 985    | 0                        | NR            |
| 470    | 217                      | NR            | 600    | 927                      | NR            | 730    | 140                      | NR            | 860    | 3                        | NR            | 990    | 0                        | NR            |
| 475    | 228                      | NR            | 605    | 954                      | NR            | 735    | 121                      | NR            | 865    | 2                        | NR            | 995    | 0                        | NR            |
| 480    | 249                      | NR            | 610    | 976                      | NR            | 740    | 104                      | NR            | 870    | 2                        | NR            | 1000   | 0                        | NR            |
| 485    | 276                      | NR            | 615    | 992                      | NR            | 745    | 89                       | NR            | 875    | 2                        | NR            |        |                          |               |

**Summary**

$R_f = 92.6$   
 $R_g = 98.5$   
 $CIE R_a = 92.4$   
 $R_9 = 58.2$

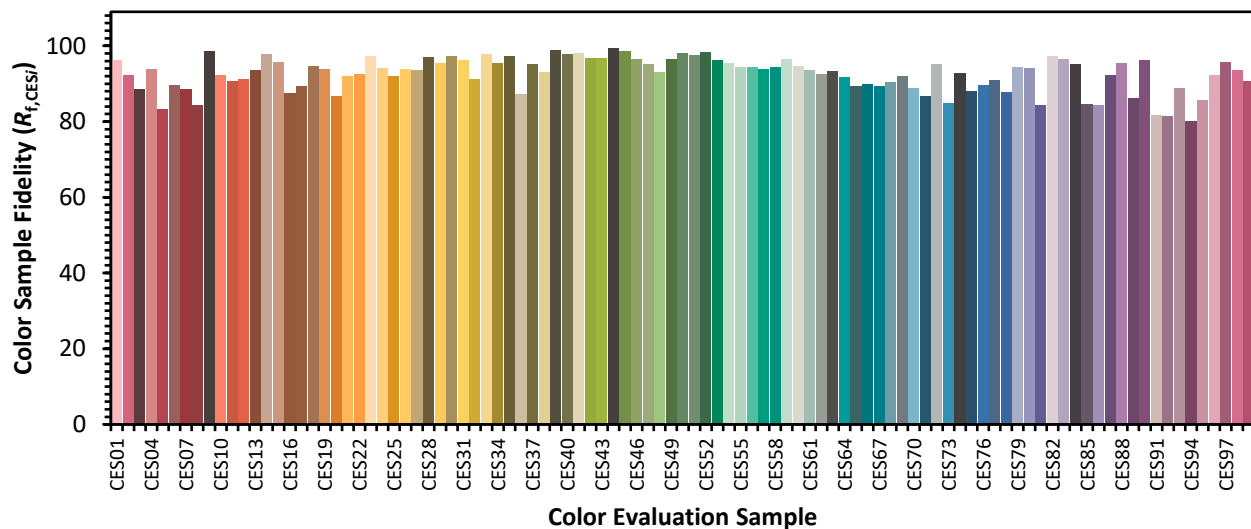


**Color Vector Graphics**



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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 94 | CES51 = 98 | CES76 = 90 |
| CES02 = 63 | CES27 = 94 | CES52 = 98 | CES77 = 91 |
| CES03 = 32 | CES28 = 97 | CES53 = 96 | CES78 = 88 |
| CES04 = 70 | CES29 = 95 | CES54 = 95 | CES79 = 94 |
| CES05 = 51 | CES30 = 97 | CES55 = 94 | CES80 = 94 |
| CES06 = 51 | CES31 = 96 | CES56 = 94 | CES81 = 84 |
| CES07 = 43 | CES32 = 91 | CES57 = 94 | CES82 = 97 |
| CES08 = 42 | CES33 = 98 | CES58 = 94 | CES83 = 97 |
| CES09 = 29 | CES34 = 96 | CES59 = 97 | CES84 = 95 |
| CES10 = 76 | CES35 = 97 | CES60 = 95 | CES85 = 85 |
| CES11 = 59 | CES36 = 87 | CES61 = 94 | CES86 = 84 |
| CES12 = 65 | CES37 = 95 | CES62 = 92 | CES87 = 92 |
| CES13 = 44 | CES38 = 93 | CES63 = 93 | CES88 = 95 |
| CES14 = 74 | CES39 = 99 | CES64 = 92 | CES89 = 86 |
| CES15 = 72 | CES40 = 98 | CES65 = 89 | CES90 = 96 |
| CES16 = 48 | CES41 = 98 | CES66 = 90 | CES91 = 82 |
| CES17 = 50 | CES42 = 97 | CES67 = 89 | CES92 = 81 |
| CES18 = 57 | CES43 = 97 | CES68 = 90 | CES93 = 89 |
| CES19 = 72 | CES44 = 99 | CES69 = 92 | CES94 = 80 |
| CES20 = 67 | CES45 = 99 | CES70 = 89 | CES95 = 86 |
| CES21 = 86 | CES46 = 96 | CES71 = 87 | CES96 = 92 |
| CES22 = 79 | CES47 = 95 | CES72 = 95 | CES97 = 96 |
| CES23 = 92 | CES48 = 93 | CES73 = 85 | CES98 = 94 |
| CES24 = 91 | CES49 = 97 | CES74 = 93 | CES99 = 91 |
| CES25 = 72 | CES50 = 98 | CES75 = 88 |            |



Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)