

Signify Classified - Internal  
Cooper Lighting Solutions Photometric Lab  
1121 Highway 74 South  
Peachtree City, GA 30269



Scaled data based on original data using  
LM-79-08 Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Test Report Prepared for  
Cooper Lighting Solutions  
(formerly Eaton)

Brand: STREETWORKS

Report Number: P1063763

Luminaire Tested: **GLAN-SA9C-930-U-T2BC**

Issue Date: 08/07/2025

**Test Information**

Test Method: LM-79-08  
Report Number: P1063763  
Test Lab: INNOVATION CENTER(G3)  
Issue Date: 08/07/2025  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: STREETWORKS  
Catalog Number: GLAN-SA9C-930-U-T2BC  
Description: GALLEON II AREA AND ROADWAY LUMINAIRE 1050mA 9xLight Square PACKAGE  
90CRI 3000K FIXTURE w/ TYPE II ANGLED BACKLIGHT CONTROL  
Light Source: (126) 3000K CCT, 90 CRI LEDs  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 33998.9 lumens  
Efficiency: N/A  
Efficacy: 81.5 lumens/watt  
Luminous Opening: Rectangular (W 1.5' x L: 1.5' x H: 0')  
IES Classification: Type II - Short  
BUG Rating: B0 - U0 - G4

Input Watts (W): 417.1  
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



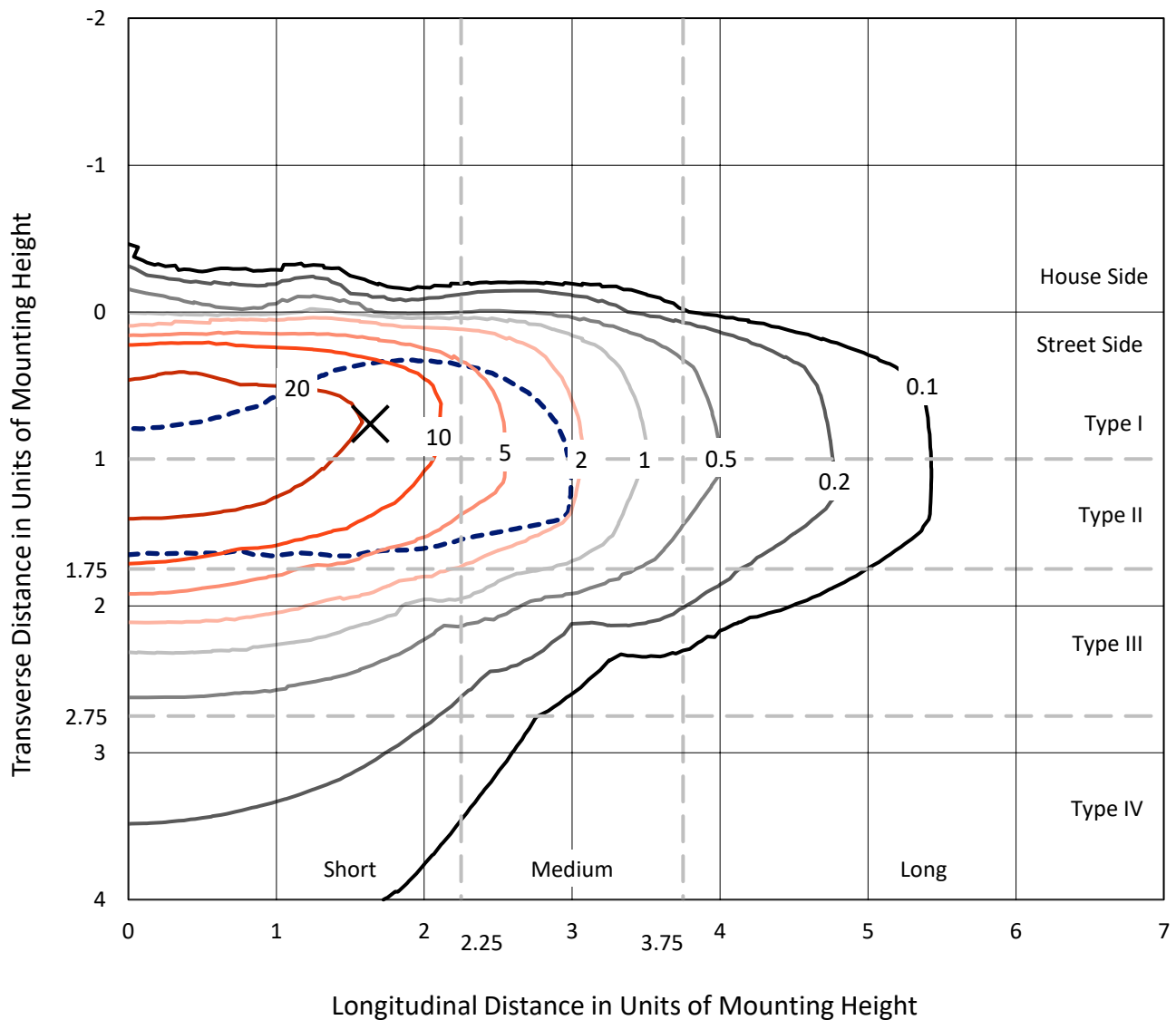
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## Iso-Footcandle Lines of Horizontal Illumination

× Max cd

--- 1/2 Max cd

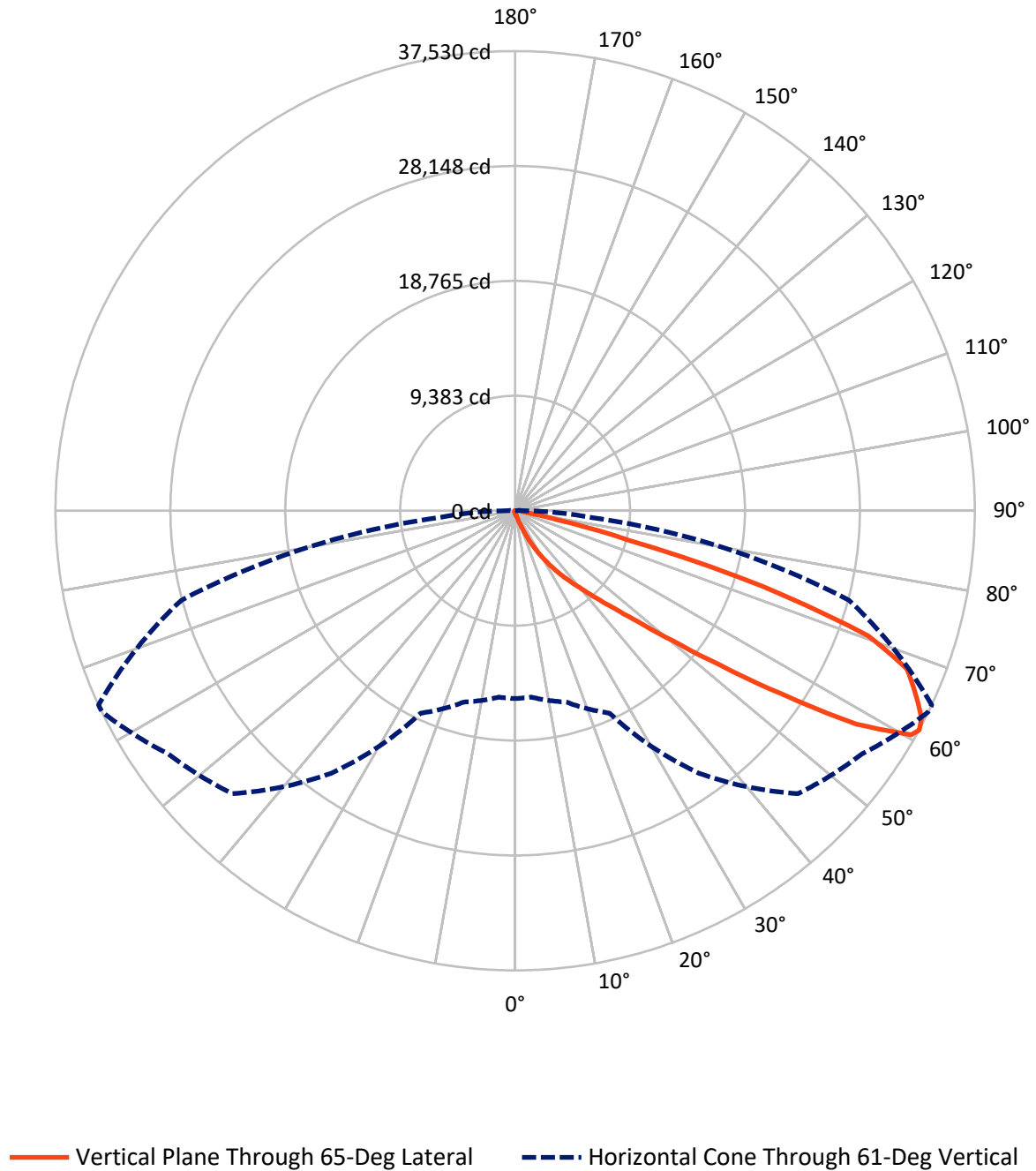


Based on 15 foot mounting height. Maximum calculated value = 45 fc  
 Type II - Short - N/A

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## Luminous Intensity Polar Plot



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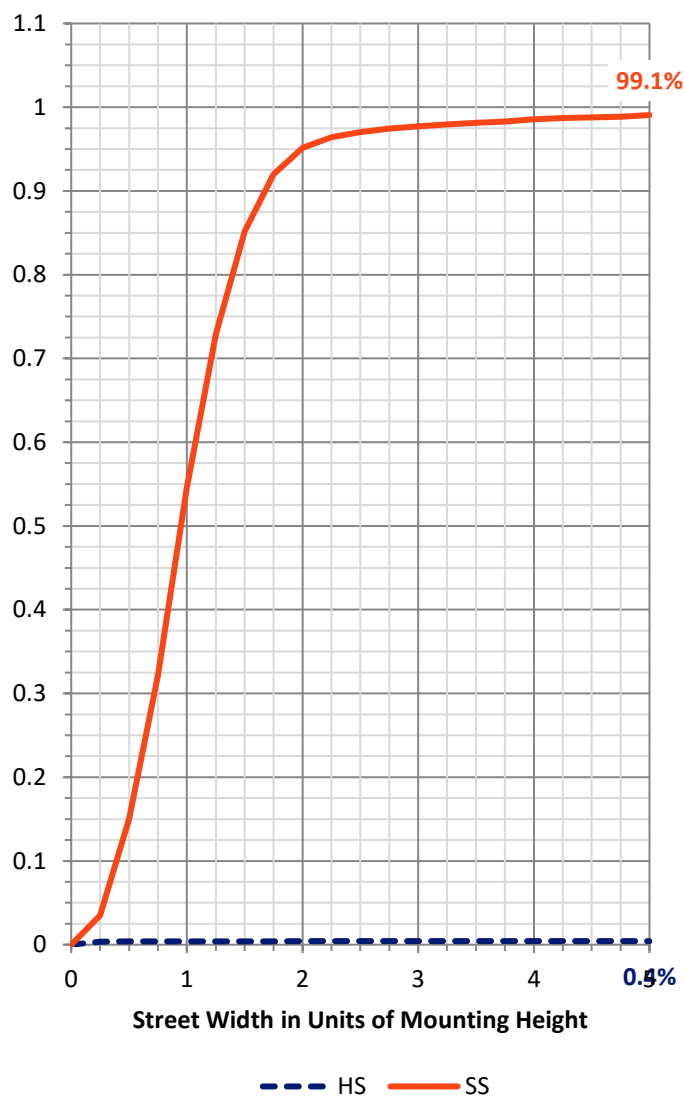
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 145.1    | 0.0    | 145.1   |
|                    | % Fixture | 0.4      | 0.0    | 0.4     |
| <b>Street Side</b> | Lumens    | 33853.8  | 0.0    | 33853.8 |
|                    | % Fixture | 99.6     | 0.0    | 99.6    |
| <b>Total</b>       | Lumens    | 33998.9  | 0.0    | 33998.9 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**Coefficient of Utilization**

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 26.5    | 0.1       |
| 10°-20°   | 279.6   | 0.8       |
| 20°-30°   | 1003.4  | 3.0       |
| 30°-40°   | 2671.3  | 7.9       |
| 40°-50°   | 7017.6  | 20.6      |
| 50°-60°   | 10871.5 | 32.0      |
| 60°-70°   | 9115.6  | 26.8      |
| 70°-80°   | 2682.6  | 7.9       |
| 80°-90°   | 330.9   | 1.0       |
| 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°    | 33998.9 | 100.0     |
| 0°-180°   | 33998.9 | 100.0     |



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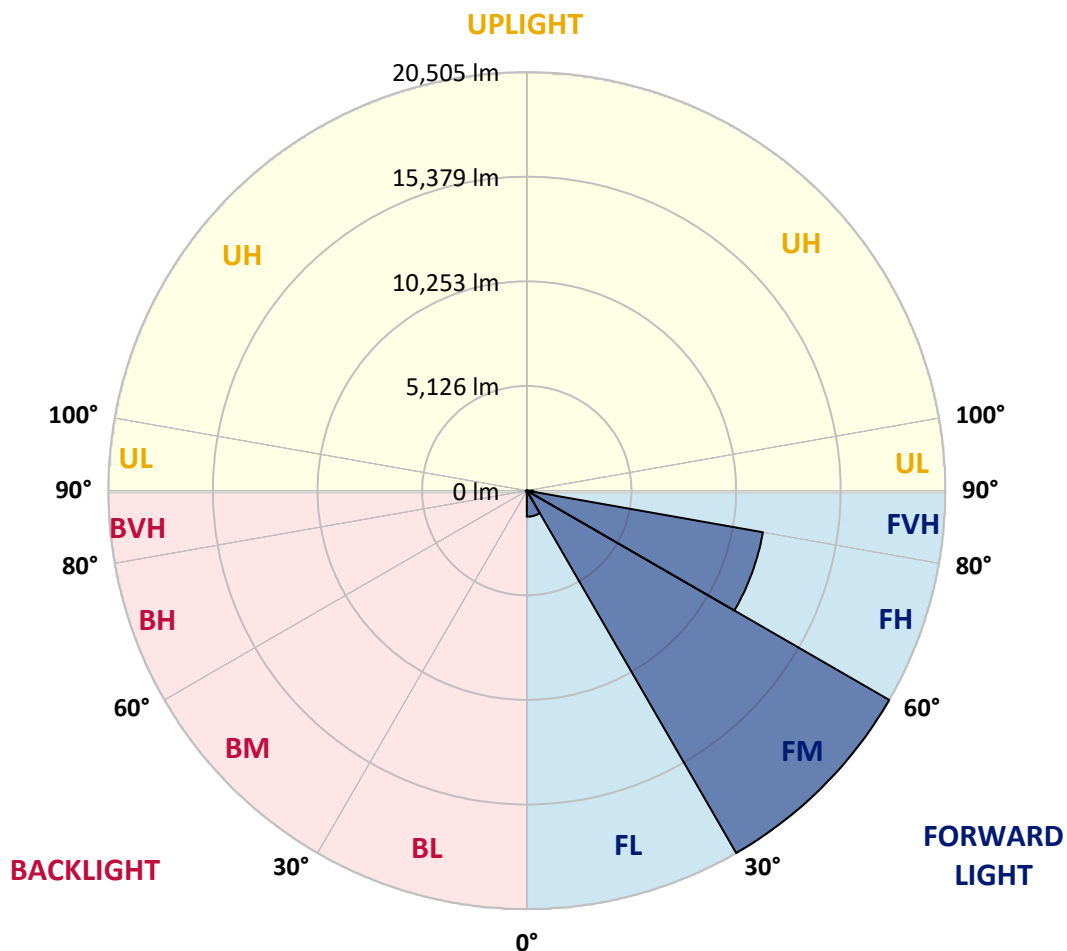
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**LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:**

| Zone |             | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |          |
|------|-------------|---------|-----------|-------------------------|------|----------|
|      |             |         |           | B                       | U    | G        |
| FL   | (0°-30°)    | 1276.8  | 3.8       |                         |      |          |
| FM   | (30°-60°)   | 20505.2 | 60.3      |                         |      |          |
| FH   | (60°-80°)   | 11747.0 | 34.6      |                         |      | G4/12000 |
| FVH  | (80°-90°)   | 324.8   | 1.0       |                         |      | G3/500   |
| BL   | (0°-30°)    | 32.6    | 0.1       | B0/110                  |      |          |
| BM   | (30°-60°)   | 55.2    | 0.2       | B0/220                  |      |          |
| BH   | (60°-80°)   | 51.2    | 0.2       | B0/110                  |      | G0/110   |
| BVH  | (80°-90°)   | 6.1     | 0.0       |                         |      | G0/10    |
| UL   | (90°-100°)  | 0.0     | 0.0       |                         | U0/0 |          |
| UH   | (100°-180°) | 0.0     | 0.0       |                         | U0/0 |          |

**BUG Rating: B0-U0-G4**

Type II Short



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 45°     | 55°     | 64°     | 65°     | 75°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 208.1   | 208.1   | 208.1   | 208.1   | 208.1   | 208.1   | 208.1   | 208.1   | 208.1   | 208.1   | 208.1   |
| 2.5°  | 252.6   | 254.9   | 250.2   | 240.9   | 233.9   | 233.9   | 231.5   | 224.5   | 224.5   | 217.5   | 212.8   |
| 5°    | 353.2   | 348.5   | 339.1   | 320.4   | 304.0   | 287.7   | 271.3   | 254.9   | 252.6   | 231.5   | 217.5   |
| 7.5°  | 577.7   | 582.4   | 551.9   | 493.5   | 444.4   | 381.2   | 322.7   | 287.7   | 283.0   | 247.9   | 219.8   |
| 10°   | 1267.6  | 1232.5  | 1162.4  | 935.5   | 769.5   | 580.0   | 430.3   | 334.4   | 329.8   | 266.6   | 224.5   |
| 12.5° | 2310.7  | 2282.6  | 2154.0  | 1920.1  | 1492.1  | 1038.4  | 629.1   | 414.0   | 399.9   | 283.0   | 226.9   |
| 15°   | 3330.4  | 3286.0  | 3215.8  | 2979.6  | 2479.1  | 1861.7  | 1029.1  | 566.0   | 528.6   | 306.4   | 224.5   |
| 17.5° | 3980.6  | 3987.6  | 3924.4  | 3823.9  | 3501.1  | 2755.1  | 1777.5  | 844.3   | 771.8   | 348.5   | 219.8   |
| 20°   | 4548.9  | 4532.5  | 4567.6  | 4513.8  | 4286.9  | 3744.4  | 2586.7  | 1337.8  | 1213.8  | 416.3   | 222.2   |
| 22.5° | 5203.7  | 5243.5  | 5269.2  | 5257.5  | 5007.3  | 4544.2  | 3505.8  | 2002.0  | 1845.3  | 540.3   | 229.2   |
| 25°   | 6080.8  | 6076.1  | 6078.4  | 6048.0  | 5804.8  | 5290.3  | 4427.3  | 2827.6  | 2668.5  | 741.4   | 245.6   |
| 27.5° | 6999.9  | 7028.0  | 7039.7  | 6929.7  | 6611.7  | 6106.5  | 5280.9  | 3730.3  | 3543.2  | 1064.1  | 266.6   |
| 30°   | 8255.8  | 8232.4  | 8178.6  | 7954.1  | 7568.2  | 6941.4  | 6122.9  | 4677.5  | 4481.1  | 1515.5  | 299.4   |
| 32.5° | 9949.1  | 9923.4  | 9652.1  | 9156.3  | 8578.6  | 7811.5  | 6969.5  | 5627.1  | 5388.5  | 2079.2  | 343.8   |
| 35°   | 12739.2 | 12779.0 | 12112.4 | 10828.5 | 9792.4  | 8856.9  | 7907.4  | 6571.9  | 6361.4  | 2773.8  | 404.6   |
| 37.5° | 17012.1 | 16794.6 | 15889.5 | 13620.9 | 11389.8 | 10161.9 | 8803.1  | 7526.1  | 7343.7  | 3629.8  | 484.1   |
| 40°   | 21163.4 | 20948.3 | 20686.3 | 18537.0 | 14165.9 | 11600.3 | 10056.7 | 8646.4  | 8410.2  | 4595.7  | 601.1   |
| 42.5° | 25527.6 | 25408.3 | 25396.6 | 23775.8 | 19231.6 | 13861.8 | 11565.2 | 9958.4  | 9757.3  | 5655.1  | 792.8   |
| 45°   | 28619.4 | 28500.1 | 28750.4 | 29033.4 | 26131.0 | 18707.8 | 14191.6 | 11663.4 | 11371.1 | 6941.4  | 1099.2  |
| 47.5° | 29035.7 | 29040.4 | 29709.3 | 30595.7 | 31257.5 | 26203.5 | 17690.4 | 13922.6 | 13567.2 | 8782.0  | 1613.7  |
| 50°   | 27651.2 | 27705.0 | 28769.1 | 30354.8 | 32136.9 | 32492.4 | 23860.0 | 17201.6 | 16675.4 | 10964.1 | 2343.4  |
| 52.5° | 25015.4 | 25076.2 | 26559.0 | 29166.7 | 31327.7 | 34003.2 | 31124.2 | 21490.9 | 20885.1 | 13686.4 | 3372.5  |
| 55°   | 22641.5 | 22679.0 | 24379.2 | 27674.6 | 30352.4 | 33182.3 | 35436.9 | 27218.5 | 26423.3 | 17035.5 | 4387.5  |
| 57.5° | 20291.1 | 20204.6 | 21310.8 | 25083.2 | 30186.4 | 32174.3 | 36073.1 | 33746.0 | 32868.9 | 20695.7 | 5178.0  |
| 60°   | 17147.8 | 17002.8 | 17891.5 | 20291.1 | 28002.0 | 32836.2 | 34882.6 | 37357.0 | 37158.2 | 25791.9 | 5788.4  |
| 61°   | 15339.9 | 15279.1 | 16172.5 | 18230.6 | 26163.7 | 32667.8 | 34597.3 | 37509.1 | 37530.1 | 28203.1 | 6062.1  |
| 62.5° | 10954.8 | 11127.8 | 12493.7 | 15169.2 | 21914.2 | 31575.6 | 34634.7 | 37039.0 | 37247.1 | 31407.2 | 6770.7  |
| 65°   | 4869.3  | 5147.6  | 6209.4  | 8386.8  | 12743.9 | 26266.6 | 34302.6 | 36007.6 | 35904.7 | 32286.6 | 9212.4  |
| 67.5° | 2888.4  | 2930.5  | 3459.0  | 4752.4  | 6749.7  | 14128.5 | 30270.6 | 34644.1 | 34506.1 | 28107.2 | 11462.3 |
| 70°   | 2275.6  | 2296.7  | 2465.1  | 2981.9  | 3917.4  | 5411.9  | 17276.4 | 29973.6 | 30574.6 | 22791.2 | 11221.4 |
| 72.5° | 2158.7  | 2154.0  | 2177.4  | 2268.6  | 2467.4  | 2684.9  | 6688.9  | 19923.9 | 21147.1 | 16413.4 | 9408.8  |
| 75°   | 2130.6  | 2121.3  | 2097.9  | 2062.8  | 1786.8  | 1581.0  | 2072.1  | 8812.5  | 9521.1  | 11214.4 | 7084.1  |
| 77.5° | 2067.5  | 2069.8  | 2074.5  | 1978.6  | 1531.9  | 1117.9  | 1003.3  | 2827.6  | 3477.7  | 7116.9  | 5035.4  |
| 80°   | 1398.6  | 1419.6  | 1454.7  | 1417.3  | 1377.5  | 809.2   | 708.6   | 1005.7  | 1019.7  | 3994.6  | 3325.7  |
| 82.5° | 708.6   | 708.6   | 692.3   | 617.4   | 533.2   | 526.2   | 563.6   | 729.7   | 739.0   | 2020.7  | 1564.6  |
| 85°   | 428.0   | 451.4   | 460.7   | 418.6   | 383.6   | 353.2   | 430.3   | 580.0   | 601.1   | 783.5   | 364.8   |
| 87.5° | 95.9    | 98.2    | 107.6   | 142.7   | 208.1   | 283.0   | 399.9   | 530.9   | 540.3   | 502.8   | 44.4    |
| 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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CATALOG NUMBER: GLAN-SA9C-930-U-T2BC

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°   | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 208.1  | 208.1 | 208.1 | 208.1 | 208.1 | 208.1 | 208.1 | 208.1 | 208.1 | 208.1 | 208.1 |
| 2.5°  | 210.5  | 205.8 | 203.5 | 196.5 | 189.4 | 182.4 | 177.7 | 175.4 | 177.7 | 180.1 | 180.1 |
| 5°    | 208.1  | 201.1 | 189.4 | 177.7 | 168.4 | 159.0 | 149.7 | 147.3 | 147.3 | 149.7 | 149.7 |
| 7.5°  | 208.1  | 196.5 | 180.1 | 166.1 | 152.0 | 138.0 | 131.0 | 126.3 | 128.6 | 128.6 | 128.6 |
| 10°   | 208.1  | 194.1 | 173.1 | 152.0 | 135.6 | 119.3 | 107.6 | 102.9 | 102.9 | 102.9 | 102.9 |
| 12.5° | 205.8  | 191.8 | 166.1 | 140.3 | 116.9 | 98.2  | 84.2  | 77.2  | 79.5  | 79.5  | 79.5  |
| 15°   | 201.1  | 184.8 | 156.7 | 119.3 | 93.6  | 74.8  | 60.8  | 53.8  | 56.1  | 60.8  | 63.1  |
| 17.5° | 194.1  | 177.7 | 140.3 | 100.6 | 74.8  | 56.1  | 42.1  | 37.4  | 39.8  | 46.8  | 46.8  |
| 20°   | 191.8  | 170.7 | 124.0 | 81.9  | 56.1  | 39.8  | 28.1  | 23.4  | 25.7  | 35.1  | 37.4  |
| 22.5° | 191.8  | 166.1 | 112.3 | 67.8  | 42.1  | 25.7  | 16.4  | 9.4   | 9.4   | 16.4  | 16.4  |
| 25°   | 194.1  | 163.7 | 102.9 | 56.1  | 30.4  | 18.7  | 9.4   | 4.7   | 9.4   | 25.7  | 30.4  |
| 27.5° | 198.8  | 161.4 | 98.2  | 46.8  | 23.4  | 16.4  | 7.0   | 16.4  | 28.1  | 28.1  | 28.1  |
| 30°   | 203.5  | 156.7 | 91.2  | 39.8  | 21.0  | 11.7  | 11.7  | 23.4  | 23.4  | 28.1  | 30.4  |
| 32.5° | 210.5  | 154.4 | 86.5  | 35.1  | 16.4  | 9.4   | 16.4  | 14.0  | 14.0  | 16.4  | 18.7  |
| 35°   | 224.5  | 156.7 | 81.9  | 35.1  | 16.4  | 11.7  | 14.0  | 7.0   | 4.7   | 4.7   | 4.7   |
| 37.5° | 243.2  | 159.0 | 74.8  | 30.4  | 14.0  | 14.0  | 7.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 40°   | 273.6  | 166.1 | 70.2  | 28.1  | 11.7  | 11.7  | 2.3   | 0.0   | 0.0   | 0.0   | 0.0   |
| 42.5° | 325.1  | 180.1 | 67.8  | 25.7  | 11.7  | 9.4   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 45°   | 428.0  | 212.8 | 63.1  | 23.4  | 11.7  | 4.7   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 47.5° | 615.1  | 290.0 | 60.8  | 18.7  | 7.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 50°   | 898.1  | 392.9 | 58.5  | 16.4  | 2.3   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 52.5° | 1146.0 | 414.0 | 39.8  | 14.0  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 55°   | 1174.1 | 285.3 | 30.4  | 9.4   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 57.5° | 935.5  | 184.8 | 25.7  | 7.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 60°   | 708.6  | 140.3 | 23.4  | 2.3   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 61°   | 680.6  | 126.3 | 23.4  | 2.3   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 62.5° | 750.7  | 109.9 | 21.0  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 65°   | 1220.8 | 91.2  | 18.7  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 67.5° | 2121.3 | 79.5  | 16.4  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 70°   | 2680.2 | 74.8  | 14.0  | 2.3   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 72.5° | 2336.4 | 67.8  | 14.0  | 4.7   | 2.3   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 75°   | 1405.6 | 58.5  | 14.0  | 9.4   | 4.7   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 77.5° | 736.7  | 44.4  | 14.0  | 11.7  | 7.0   | 2.3   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 80°   | 357.8  | 39.8  | 16.4  | 11.7  | 9.4   | 4.7   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 82.5° | 140.3  | 32.7  | 18.7  | 16.4  | 11.7  | 7.0   | 2.3   | 0.0   | 0.0   | 0.0   | 0.0   |
| 85°   | 63.1   | 28.1  | 21.0  | 18.7  | 16.4  | 9.4   | 2.3   | 0.0   | 0.0   | 0.0   | 0.0   |
| 87.5° | 32.7   | 25.7  | 23.4  | 21.0  | 16.4  | 11.7  | 4.7   | 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   |

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:  $4\pi$   
 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  
 R<sub>f</sub>: 92.6  
 R<sub>g</sub>: 98.5

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



### Test Conditions

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

REPORT NUMBER: SP1-2407-184-14

| 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           |

REPORT NUMBER: SP1-2407-184-14

**CIE 1931 Chromaticity Diagram**



**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 3000K 4-step quadrangle

REPORT NUMBER: SP1-2407-184-14

### Photopic Flux vs. Wavelength



### Photopic Lumens: NR

| $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) |
|-------------------|----------------------------------------|--------------------------------|-------------------|----------------------------------------|--------------------------------|-------------------|----------------------------------------|--------------------------------|-------------------|----------------------------------------|--------------------------------|-------------------|----------------------------------------|--------------------------------|
| 360               | 0                                      | NR                             | 490               | 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

| λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(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               |           |                             |                  |

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### Melanopic Flux vs. Wavelength



Melanopic Lumens: NR

M/P: 2.69

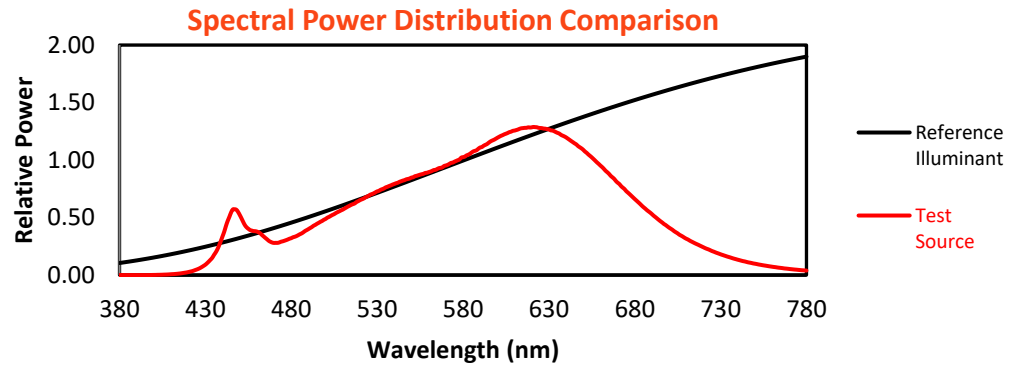
| $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) |
|-------------------|----------------------------------------|--------------------------------|-------------------|----------------------------------------|--------------------------------|-------------------|----------------------------------------|--------------------------------|-------------------|----------------------------------------|--------------------------------|-------------------|----------------------------------------|--------------------------------|
| 360               | 0                                      | NR                             | 490               | 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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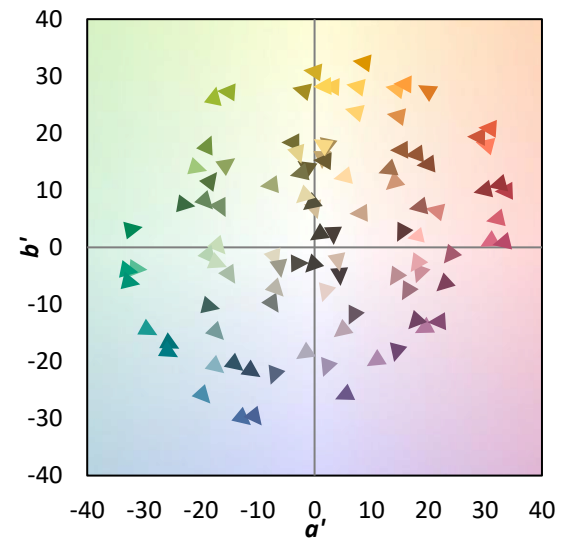
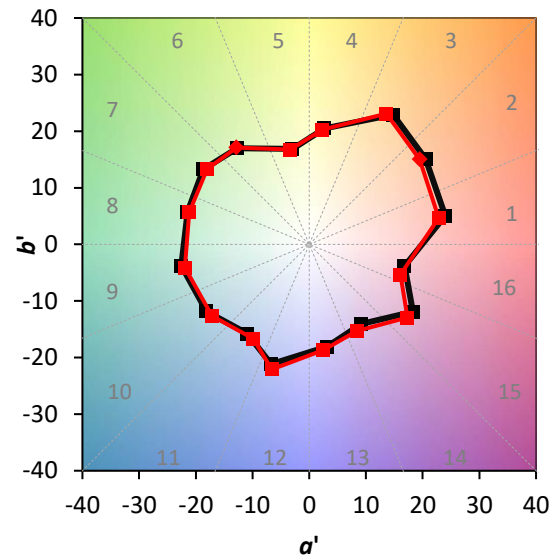
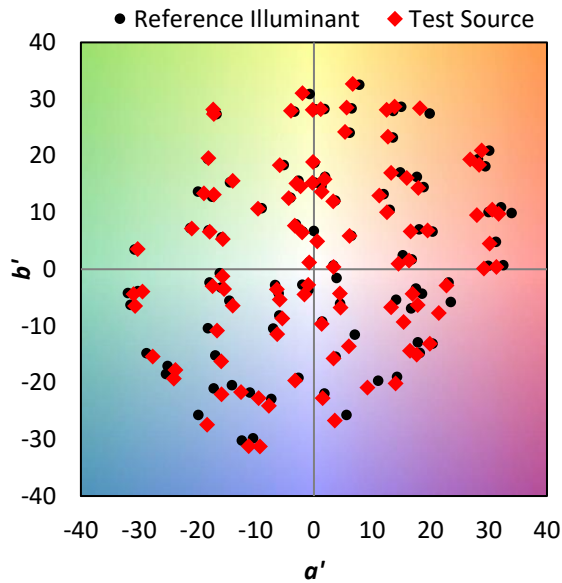
TM-30-18

### 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)