

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: P1065723

Luminaire Tested: **NVN-SA4C-740-U-T3BC**

Issue Date: 08/07/2025

**Test Information**

Test Method: LM-79-08  
Report Number: P1065723  
Test Lab: INNOVATION CENTER(G3)  
Issue Date: 08/07/2025  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: STREETWORKS  
Catalog Number: NVN-SA4C-740-U-T3BC  
Description: Navion AREA AND ROADWAY LUMINAIRE 1050mA 4xLight Square PACKAGE  
70CRI 4000K FIXTURE w/ TYPE III ANGLED BACKLIGHT CONTROL  
Light Source: (56) 4000K CCT, 70 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 22945.1 lumens  
Efficiency: N/A  
Efficacy: 120.5 lumens/watt  
Luminous Opening: Rectangular (W 1' x L: 1' x H: 0')  
IES Classification: Type III - Short  
BUG Rating: B0 - U0 - G4

Input Watts (W): 190.4  
Input Voltage (V): 120  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.97  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 28.75 FT

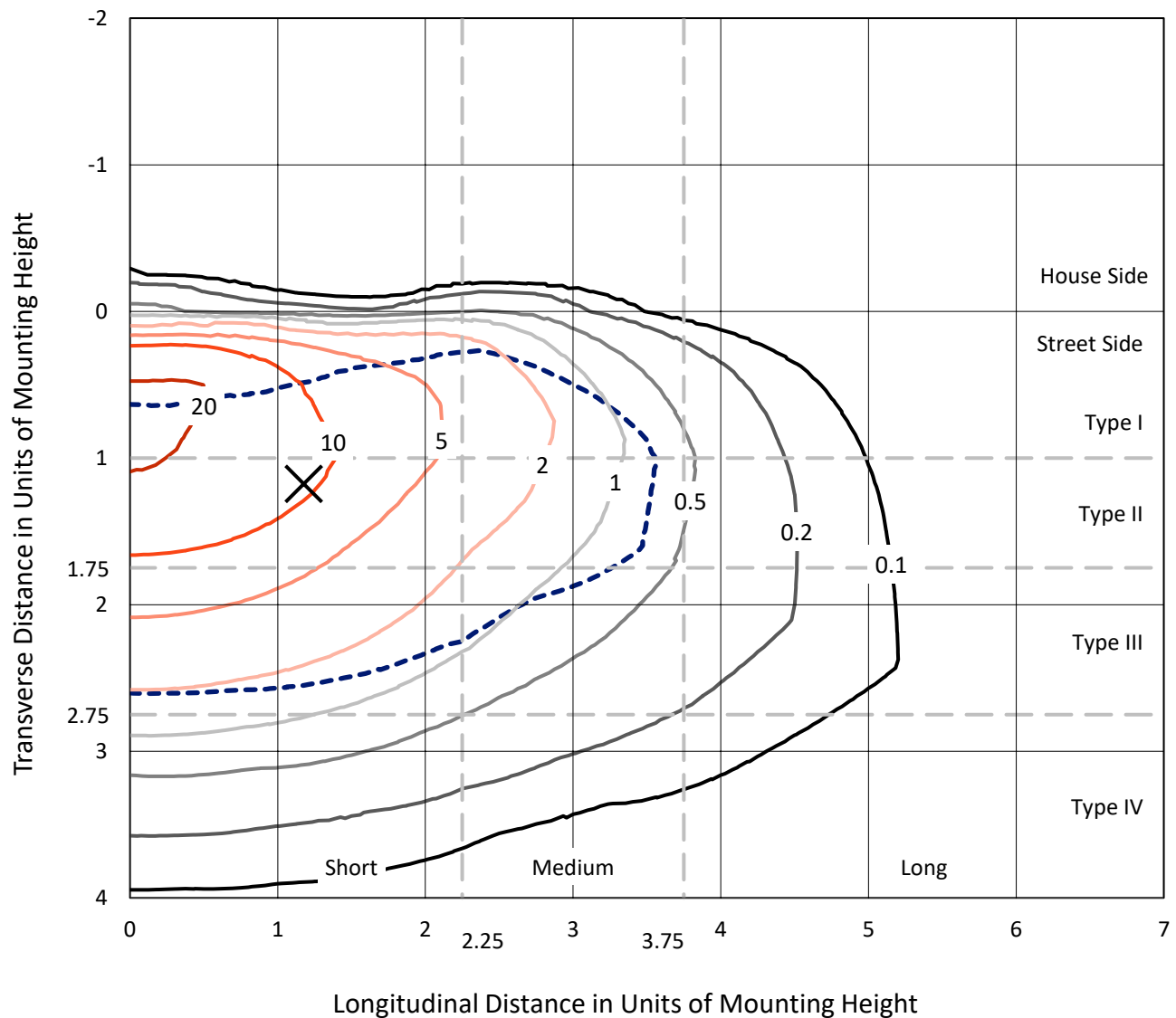


REPORT NUMBER: P1065723

CATALOG NUMBER: NVN-SA4C-740-U-T3BC

## Iso-Footcandle Lines of Horizontal Illumination

× Max cd  
 --- 1/2 Max cd

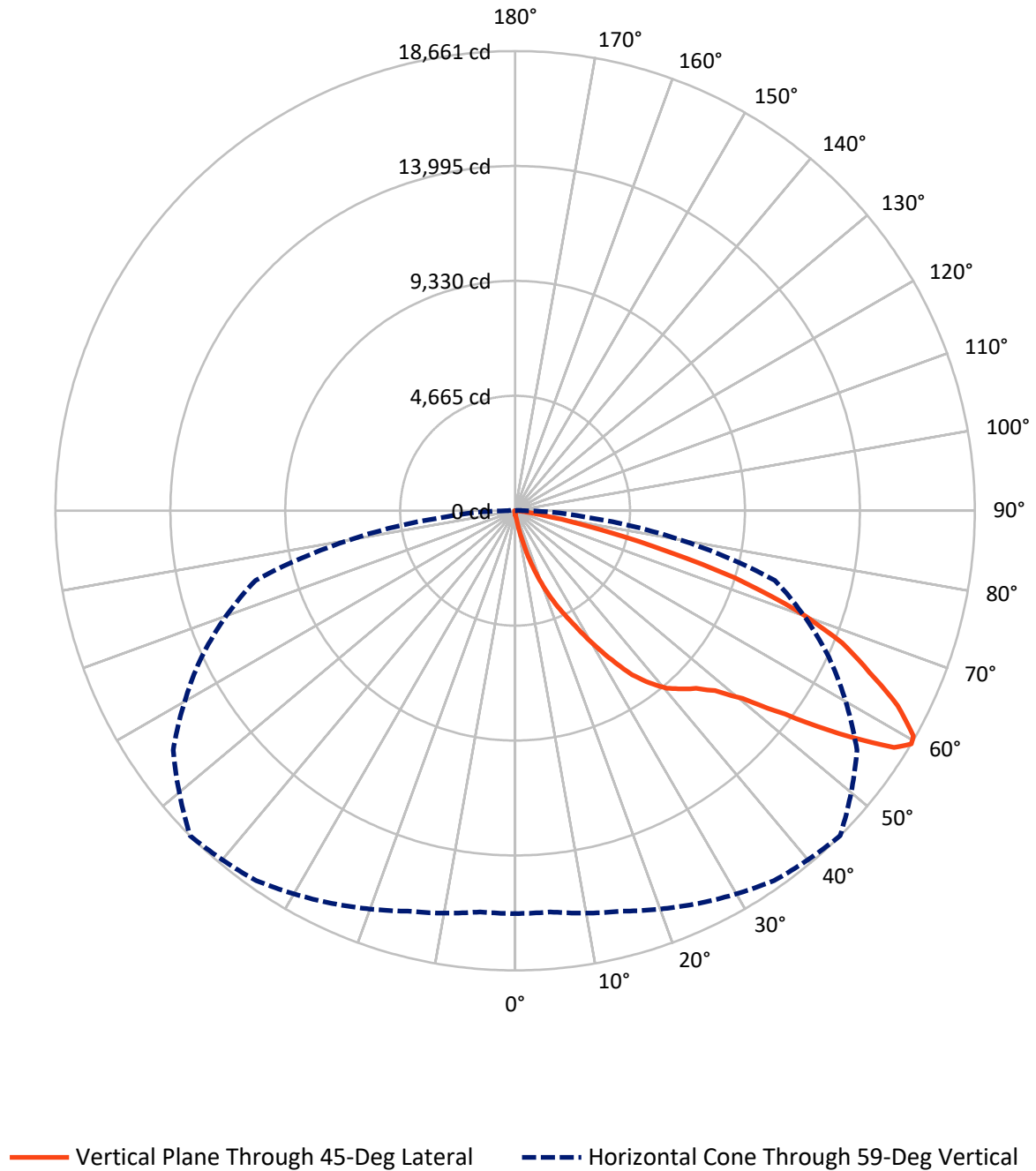


Based on 15 foot mounting height. Maximum calculated value = 25 fc  
 Type III - Short - N/A

REPORT NUMBER: P1065723

CATALOG NUMBER: NVN-SA4C-740-U-T3BC

## Luminous Intensity Polar Plot



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CATALOG NUMBER: NVN-SA4C-740-U-T3BC

**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 81.5     | 0.0    | 81.5    |
|                    | % Fixture | 0.4      | 0.0    | 0.4     |
| <b>Street Side</b> | Lumens    | 22863.6  | 0.0    | 22863.6 |
|                    | % Fixture | 99.6     | 0.0    | 99.6    |
| <b>Total</b>       | Lumens    | 22945.1  | 0.0    | 22945.1 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**Coefficient of Utilization**

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 21.3    | 0.1       |
| 10°-20°   | 253.6   | 1.1       |
| 20°-30°   | 911.3   | 4.0       |
| 30°-40°   | 2117.5  | 9.2       |
| 40°-50°   | 3609.1  | 15.7      |
| 50°-60°   | 5946.9  | 25.9      |
| 60°-70°   | 6875.9  | 30.0      |
| 70°-80°   | 2954.1  | 12.9      |
| 80°-90°   | 255.3   | 1.1       |
| 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°    | 22945.1 | 100.0     |
| 0°-180°   | 22945.1 | 100.0     |



REPORT NUMBER: P1065723

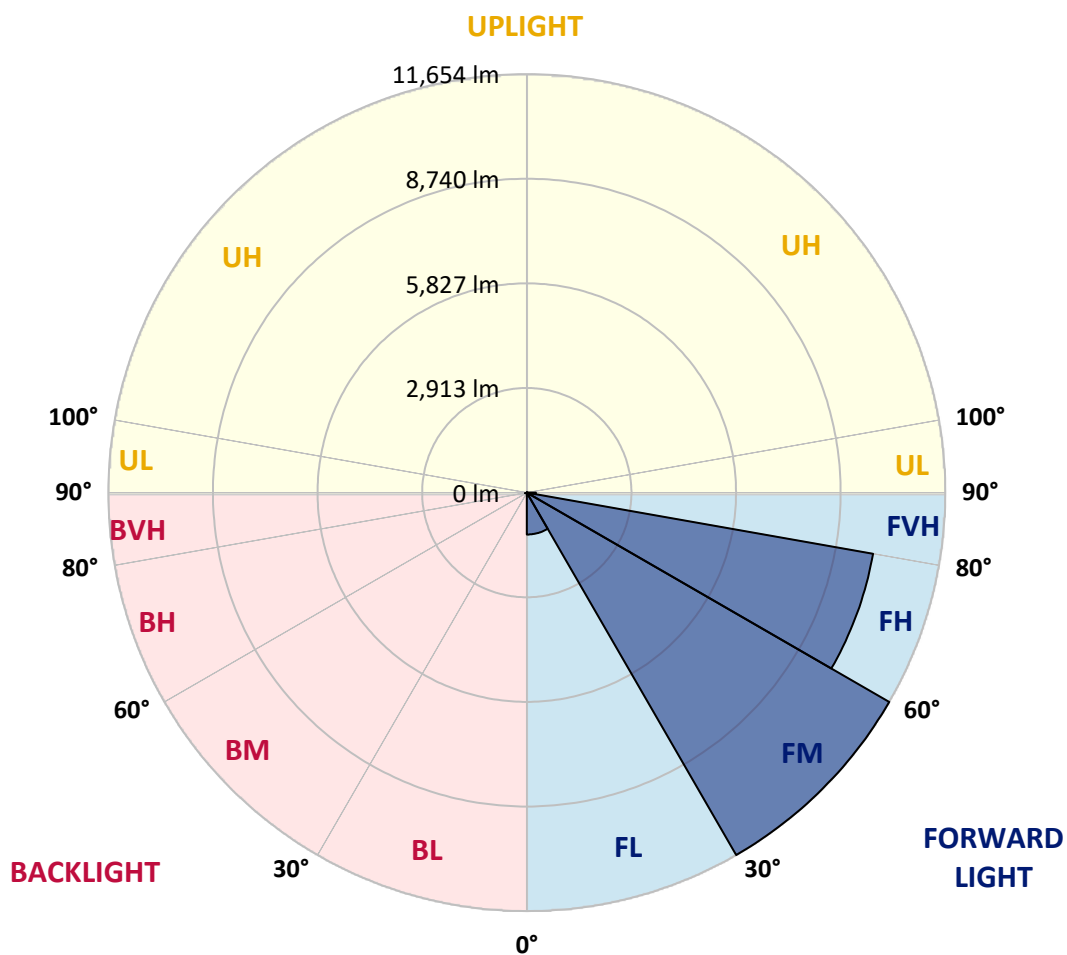
CATALOG NUMBER: NVN-SA4C-740-U-T3BC

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

| Zone |             | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |          |
|------|-------------|---------|-----------|-------------------------|------|----------|
|      |             |         |           | B                       | U    | G        |
| FL   | (0°-30°)    | 1166.1  | 5.1       |                         |      |          |
| FM   | (30°-60°)   | 11653.8 | 50.8      |                         |      |          |
| FH   | (60°-80°)   | 9791.7  | 42.7      |                         |      | G4/12000 |
| FVH  | (80°-90°)   | 252.0   | 1.1       |                         |      | G3/500   |
| BL   | (0°-30°)    | 20.1    | 0.1       | B0/110                  |      |          |
| BM   | (30°-60°)   | 19.7    | 0.1       | B0/220                  |      |          |
| BH   | (60°-80°)   | 38.3    | 0.2       | B0/110                  |      | G0/110   |
| BVH  | (80°-90°)   | 3.3     | 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 III Short



REPORT NUMBER: P1065723

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**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 44°     | 45°     | 55°     | 65°     | 75°     | 85°    |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--------|
| 0°    | 145.0   | 145.0   | 145.0   | 145.0   | 145.0   | 145.0   | 145.0   | 145.0   | 145.0   | 145.0   | 145.0  |
| 2.5°  | 188.2   | 188.2   | 183.6   | 177.4   | 175.9   | 171.3   | 171.3   | 166.6   | 160.5   | 155.8   | 149.7  |
| 5°    | 273.1   | 271.5   | 259.2   | 243.8   | 223.7   | 211.4   | 211.4   | 194.4   | 179.0   | 165.1   | 152.7  |
| 7.5°  | 597.1   | 583.2   | 538.4   | 464.4   | 367.2   | 302.4   | 297.8   | 242.2   | 205.2   | 177.4   | 154.3  |
| 10°   | 1370.0  | 1322.2  | 1259.0  | 1081.5  | 799.2   | 558.5   | 547.7   | 353.3   | 245.3   | 191.3   | 157.4  |
| 12.5° | 2244.8  | 2283.4  | 2156.9  | 1877.6  | 1547.5  | 1151.0  | 1073.8  | 595.5   | 324.0   | 209.8   | 160.5  |
| 15°   | 3040.9  | 3031.7  | 2960.7  | 2732.4  | 2351.3  | 1823.6  | 1775.8  | 1035.2  | 464.4   | 239.1   | 163.5  |
| 17.5° | 3636.5  | 3625.7  | 3557.8  | 3411.2  | 3118.1  | 2590.4  | 2548.8  | 1650.8  | 728.2   | 280.8   | 166.6  |
| 20°   | 4264.4  | 4250.5  | 4154.8  | 4037.6  | 3781.5  | 3332.5  | 3283.1  | 2338.9  | 1140.2  | 348.7   | 166.6  |
| 22.5° | 5017.3  | 4991.1  | 4889.2  | 4690.2  | 4420.2  | 4029.9  | 3985.1  | 3042.5  | 1650.8  | 459.8   | 174.3  |
| 25°   | 5927.6  | 5882.8  | 5742.4  | 5563.5  | 5237.9  | 4719.5  | 4671.7  | 3826.2  | 2266.4  | 627.9   | 182.1  |
| 27.5° | 6965.9  | 6973.6  | 6783.8  | 6481.4  | 6044.8  | 5515.6  | 5426.1  | 4528.2  | 2903.6  | 868.6   | 191.3  |
| 30°   | 8198.6  | 8121.5  | 7854.6  | 7502.8  | 7078.5  | 6404.3  | 6317.9  | 5227.1  | 3619.5  | 1223.5  | 206.7  |
| 32.5° | 9352.6  | 9269.3  | 8909.9  | 8467.1  | 8011.9  | 7300.7  | 7229.7  | 6012.4  | 4270.6  | 1643.1  | 234.5  |
| 35°   | 10343.1 | 10284.5 | 9781.6  | 9241.6  | 8837.3  | 8201.7  | 8180.1  | 6888.7  | 5035.8  | 2095.2  | 265.4  |
| 37.5° | 11214.8 | 11108.4 | 10461.9 | 9901.9  | 9491.5  | 8922.2  | 8875.9  | 7691.0  | 5773.3  | 2619.7  | 311.7  |
| 40°   | 11958.5 | 11899.9 | 11111.5 | 10375.5 | 10042.3 | 9533.2  | 9474.5  | 8394.5  | 6535.4  | 3229.1  | 368.7  |
| 42.5° | 12754.6 | 12677.5 | 11912.2 | 11086.8 | 10472.7 | 9928.1  | 9889.6  | 8974.7  | 7214.3  | 3898.7  | 453.6  |
| 45°   | 13654.1 | 13510.6 | 12839.4 | 12098.9 | 11165.5 | 10337.0 | 10293.8 | 9491.5  | 7910.1  | 4617.7  | 557.0  |
| 47.5° | 14615.2 | 14490.3 | 13947.2 | 13427.3 | 12353.5 | 11011.2 | 10918.6 | 9931.2  | 8601.3  | 5447.7  | 688.1  |
| 50°   | 15593.4 | 15596.5 | 15189.2 | 14939.2 | 13805.3 | 12106.6 | 11975.5 | 10577.7 | 9328.0  | 6336.4  | 882.5  |
| 52.5° | 16732.0 | 16761.3 | 16755.2 | 16570.0 | 15690.6 | 13897.8 | 13721.9 | 11558.9 | 10171.9 | 7373.2  | 1151.0 |
| 55°   | 17208.8 | 17261.2 | 17602.2 | 18012.6 | 17773.4 | 16168.9 | 15980.7 | 13251.4 | 11290.4 | 8528.8  | 1549.0 |
| 57.5° | 16818.4 | 16877.0 | 17347.6 | 18066.6 | 18615.8 | 18157.6 | 18136.0 | 15454.5 | 12763.9 | 9929.7  | 2200.1 |
| 59°   | 16354.0 | 16346.3 | 16829.2 | 17591.4 | 18331.9 | 18629.7 | 18660.6 | 16944.9 | 14047.5 | 10912.5 | 2761.7 |
| 60°   | 16045.5 | 16051.6 | 16372.5 | 17154.8 | 17941.6 | 18458.4 | 18578.8 | 17822.8 | 14797.3 | 11619.1 | 3243.0 |
| 62.5° | 14854.4 | 14925.4 | 15179.9 | 15906.6 | 16653.3 | 17230.3 | 17435.5 | 18605.0 | 16943.4 | 13288.4 | 4917.0 |
| 65°   | 13560.0 | 13564.6 | 13927.1 | 14548.9 | 15264.8 | 15670.5 | 15800.1 | 17387.7 | 18376.7 | 14988.6 | 7112.5 |
| 67.5° | 11250.3 | 11344.4 | 11756.4 | 12763.9 | 13709.6 | 14223.4 | 14322.1 | 15135.2 | 17782.7 | 16096.4 | 8212.5 |
| 70°   | 7873.1  | 7996.5  | 8584.3  | 9891.1  | 11299.7 | 12143.6 | 12137.5 | 12581.8 | 15650.5 | 15602.7 | 6962.8 |
| 72.5° | 3931.1  | 4144.0  | 4623.9  | 6023.2  | 7729.6  | 9054.9  | 9334.1  | 10121.0 | 12572.5 | 12959.8 | 5194.7 |
| 75°   | 1737.2  | 1749.6  | 2022.7  | 2727.7  | 3841.7  | 5524.9  | 5774.8  | 8033.5  | 9645.8  | 9007.1  | 3752.2 |
| 77.5° | 1010.6  | 1019.8  | 1069.2  | 1225.0  | 1556.7  | 2707.7  | 2988.5  | 5268.8  | 6816.2  | 5234.8  | 2446.9 |
| 80°   | 367.2   | 376.5   | 374.9   | 464.4   | 681.9   | 1066.1  | 1188.0  | 2553.4  | 4546.7  | 2757.0  | 1282.1 |
| 82.5° | 225.3   | 225.3   | 217.5   | 219.1   | 248.4   | 408.9   | 447.4   | 1087.7  | 2214.0  | 1357.7  | 367.2  |
| 85°   | 111.1   | 117.3   | 125.0   | 140.4   | 166.6   | 202.1   | 214.5   | 311.7   | 745.2   | 328.6   | 87.9   |
| 87.5° | 66.3    | 67.9    | 74.1    | 89.5    | 111.1   | 145.0   | 154.3   | 211.4   | 266.9   | 220.6   | 21.6   |
| 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: P1065723

CATALOG NUMBER: NVN-SA4C-740-U-T3BC

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°   | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 145.0  | 145.0 | 145.0 | 145.0 | 145.0 | 145.0 | 145.0 | 145.0 | 145.0 | 145.0 | 145.0 |
| 2.5°  | 146.6  | 145.0 | 137.3 | 131.1 | 125.0 | 118.8 | 114.2 | 109.5 | 109.5 | 111.1 | 109.5 |
| 5°    | 146.6  | 140.4 | 128.1 | 117.3 | 108.0 | 100.3 | 92.6  | 86.4  | 84.9  | 84.9  | 86.4  |
| 7.5°  | 145.0  | 137.3 | 120.3 | 106.5 | 94.1  | 83.3  | 75.6  | 67.9  | 66.3  | 67.9  | 66.3  |
| 10°   | 143.5  | 134.2 | 114.2 | 97.2  | 80.2  | 69.4  | 58.6  | 50.9  | 50.9  | 50.9  | 52.5  |
| 12.5° | 143.5  | 129.6 | 108.0 | 87.9  | 69.4  | 57.1  | 46.3  | 38.6  | 37.0  | 37.0  | 37.0  |
| 15°   | 141.9  | 126.5 | 101.8 | 77.1  | 58.6  | 43.2  | 33.9  | 26.2  | 26.2  | 26.2  | 26.2  |
| 17.5° | 138.9  | 121.9 | 94.1  | 67.9  | 46.3  | 32.4  | 23.1  | 15.4  | 15.4  | 18.5  | 18.5  |
| 20°   | 135.8  | 117.3 | 84.9  | 55.5  | 38.6  | 24.7  | 15.4  | 9.3   | 9.3   | 13.9  | 15.4  |
| 22.5° | 137.3  | 117.3 | 78.7  | 49.4  | 30.9  | 18.5  | 12.3  | 7.7   | 6.2   | 10.8  | 13.9  |
| 25°   | 138.9  | 114.2 | 71.0  | 43.2  | 23.1  | 13.9  | 9.3   | 3.1   | 1.5   | 3.1   | 4.6   |
| 27.5° | 138.9  | 111.1 | 61.7  | 33.9  | 17.0  | 10.8  | 4.6   | 0.0   | 0.0   | 0.0   | 0.0   |
| 30°   | 137.3  | 106.5 | 54.0  | 27.8  | 12.3  | 6.2   | 1.5   | 0.0   | 0.0   | 0.0   | 0.0   |
| 32.5° | 135.8  | 101.8 | 49.4  | 21.6  | 10.8  | 3.1   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 35°   | 137.3  | 95.7  | 43.2  | 17.0  | 6.2   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 3.1   |
| 37.5° | 141.9  | 89.5  | 37.0  | 13.9  | 4.6   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 40°   | 148.1  | 84.9  | 30.9  | 10.8  | 1.5   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 42.5° | 160.5  | 84.9  | 27.8  | 7.7   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 45°   | 175.9  | 84.9  | 23.1  | 6.2   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 47.5° | 195.9  | 86.4  | 20.1  | 6.2   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 50°   | 220.6  | 89.5  | 18.5  | 4.6   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 52.5° | 239.1  | 86.4  | 17.0  | 4.6   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 55°   | 271.5  | 83.3  | 15.4  | 3.1   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 57.5° | 314.7  | 78.7  | 15.4  | 1.5   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 59°   | 357.9  | 72.5  | 15.4  | 1.5   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 60°   | 407.3  | 69.4  | 13.9  | 1.5   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 62.5° | 672.7  | 61.7  | 12.3  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 65°   | 1299.1 | 58.6  | 10.8  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 67.5° | 2099.8 | 58.6  | 7.7   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 70°   | 2207.8 | 58.6  | 6.2   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 72.5° | 1468.8 | 47.8  | 4.6   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 75°   | 786.8  | 43.2  | 4.6   | 1.5   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 77.5° | 424.3  | 40.1  | 6.2   | 3.1   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 80°   | 186.7  | 29.3  | 7.7   | 4.6   | 3.1   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 82.5° | 74.1   | 20.1  | 9.3   | 7.7   | 6.2   | 3.1   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 85°   | 35.5   | 15.4  | 12.3  | 10.8  | 7.7   | 4.6   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 87.5° | 17.0   | 15.4  | 13.9  | 12.3  | 10.8  | 7.7   | 1.5   | 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: SP1-2407-184-1

Test Date: 10/09/2024

Luminaire Tested: GSS-SB1A-740-U-5WQ

Data in this report applies to families of products including GSS-SB1A-740-U-5WQ

### Test Information

Test Method: LM-79-2019  
 Report Number: SP1-2407-184-1  
 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-740-U-5WQ**  
 Description: GALLEON II SITE SLIM 1SQ 350MA 5WQ HIGH DENSITY LIGHTSQUARE WITH 70 CRI  
 4000K CCT 26 LEDS

### Spectral Parameters

|                           |          |           |      |      |       |
|---------------------------|----------|-----------|------|------|-------|
| CCT (K):                  | 3949     | CRI (Ra): | 70.7 |      |       |
| CIE u':                   | 0.2248   | R1:       | 68.0 | R9:  | -36.7 |
| CIE v':                   | 0.5053   | R2:       | 76.0 | R10: | 45.1  |
| Duv:                      | 0.0022   | R3:       | 84.3 | R11: | 70.7  |
| CIE x:                    | 0.3844   | R4:       | 72.0 | R12: | 47.1  |
| CIE y:                    | 0.3840   | R5:       | 68.6 | R13: | 68.5  |
| CIE z:                    | 0.2316   | R6:       | 68.3 | R14: | 91.1  |
| Peak Wavelength (nm):     | 440      | R7:       | 77.9 | R15: | 58.7  |
| Dominant Wavelength (nm): | 578      | R8:       | 50.3 |      |       |
| Purity:                   | 30.60026 |           |      |      |       |
| Rf:                       | 71.8     |           |      |      |       |
| Rg:                       | 96.5     |           |      |      |       |



### Test Conditions

Stabilization Time: 34M  
 Operation Time: 1H 34M  
 Sphere Temperature (°C): 25.2

REPORT NUMBER: SP1-2407-184-1

| 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: SP1-2407-184-1

**CIE 1931 Chromaticity Diagram**



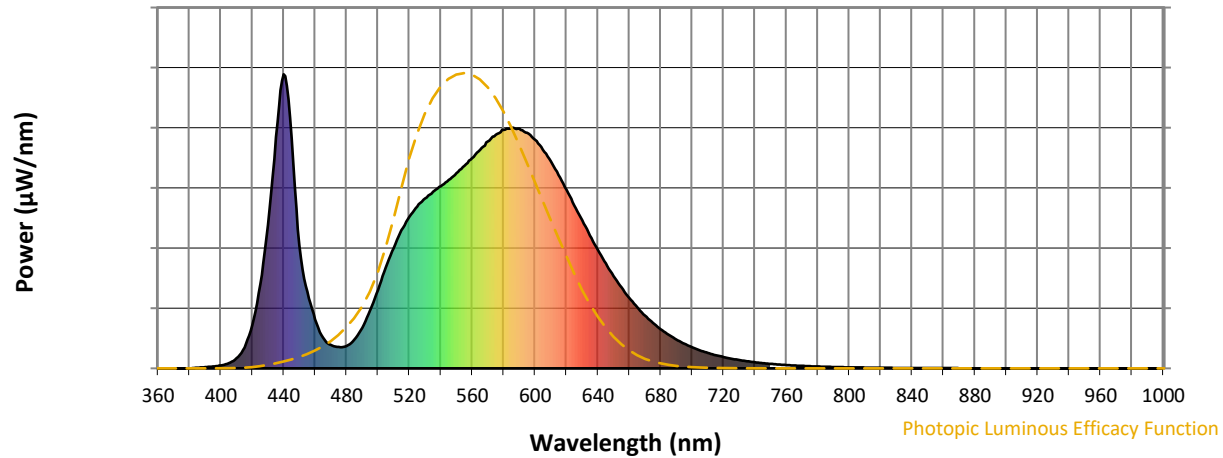
**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 4000K 4-step quadrangle

REPORT NUMBER: SP1-2407-184-1

### 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               | 139                                  | NR                             | 620               | 607                                  | NR                             | 750               | 15                                   | NR                             | 880               | 0                                    | NR                             |
| 365               | 0                                    | NR                             | 495               | 198                                  | NR                             | 625               | 554                                  | NR                             | 755               | 13                                   | NR                             | 885               | 0                                    | NR                             |
| 370               | 0                                    | NR                             | 500               | 267                                  | NR                             | 630               | 504                                  | NR                             | 760               | 11                                   | NR                             | 890               | 0                                    | NR                             |
| 375               | 0                                    | NR                             | 505               | 343                                  | NR                             | 635               | 452                                  | NR                             | 765               | 10                                   | NR                             | 895               | 0                                    | NR                             |
| 380               | 0                                    | NR                             | 510               | 410                                  | NR                             | 640               | 403                                  | NR                             | 770               | 8                                    | NR                             | 900               | 0                                    | NR                             |
| 385               | 2                                    | NR                             | 515               | 470                                  | NR                             | 645               | 357                                  | NR                             | 775               | 7                                    | NR                             | 905               | 0                                    | NR                             |
| 390               | 4                                    | NR                             | 520               | 516                                  | NR                             | 650               | 314                                  | NR                             | 780               | 6                                    | NR                             | 910               | 0                                    | NR                             |
| 395               | 7                                    | NR                             | 525               | 550                                  | NR                             | 655               | 275                                  | NR                             | 785               | 5                                    | NR                             | 915               | 0                                    | NR                             |
| 400               | 10                                   | NR                             | 530               | 578                                  | NR                             | 660               | 240                                  | NR                             | 790               | 5                                    | NR                             | 920               | 0                                    | NR                             |
| 405               | 17                                   | NR                             | 535               | 601                                  | NR                             | 665               | 208                                  | NR                             | 795               | 4                                    | NR                             | 925               | 0                                    | NR                             |
| 410               | 35                                   | NR                             | 540               | 620                                  | NR                             | 670               | 179                                  | NR                             | 800               | 4                                    | NR                             | 930               | 0                                    | NR                             |
| 415               | 70                                   | NR                             | 545               | 641                                  | NR                             | 675               | 155                                  | NR                             | 805               | 3                                    | NR                             | 935               | 0                                    | NR                             |
| 420               | 147                                  | NR                             | 550               | 664                                  | NR                             | 680               | 133                                  | NR                             | 810               | 3                                    | NR                             | 940               | 0                                    | NR                             |
| 425               | 285                                  | NR                             | 555               | 689                                  | NR                             | 685               | 114                                  | NR                             | 815               | 2                                    | NR                             | 945               | 0                                    | NR                             |
| 430               | 487                                  | NR                             | 560               | 715                                  | NR                             | 690               | 98                                   | NR                             | 820               | 2                                    | NR                             | 950               | 0                                    | NR                             |
| 435               | 787                                  | NR                             | 565               | 743                                  | NR                             | 695               | 84                                   | NR                             | 825               | 2                                    | NR                             | 955               | 0                                    | NR                             |
| 440               | 1000                                 | NR                             | 570               | 771                                  | NR                             | 700               | 72                                   | NR                             | 830               | 2                                    | NR                             | 960               | 0                                    | NR                             |
| 445               | 783                                  | NR                             | 575               | 794                                  | NR                             | 705               | 61                                   | NR                             | 835               | 1                                    | NR                             | 965               | 0                                    | NR                             |
| 450               | 417                                  | NR                             | 580               | 811                                  | NR                             | 710               | 52                                   | NR                             | 840               | 1                                    | NR                             | 970               | 0                                    | NR                             |
| 455               | 261                                  | NR                             | 585               | 817                                  | NR                             | 715               | 45                                   | NR                             | 845               | 1                                    | NR                             | 975               | 0                                    | NR                             |
| 460               | 167                                  | NR                             | 590               | 815                                  | NR                             | 720               | 39                                   | NR                             | 850               | 1                                    | NR                             | 980               | 0                                    | NR                             |
| 465               | 104                                  | NR                             | 595               | 801                                  | NR                             | 725               | 33                                   | NR                             | 855               | 1                                    | NR                             | 985               | 0                                    | NR                             |
| 470               | 79                                   | NR                             | 600               | 777                                  | NR                             | 730               | 28                                   | NR                             | 860               | 1                                    | NR                             | 990               | 0                                    | NR                             |
| 475               | 73                                   | NR                             | 605               | 744                                  | NR                             | 735               | 24                                   | NR                             | 865               | 1                                    | NR                             | 995               | 0                                    | NR                             |
| 480               | 76                                   | NR                             | 610               | 704                                  | NR                             | 740               | 21                                   | NR                             | 870               | 1                                    | NR                             | 1000              | 0                                    | NR                             |
| 485               | 98                                   | NR                             | 615               | 657                                  | NR                             | 745               | 18                                   | NR                             | 875               | 1                                    | NR                             |                   |                                      |                                |

REPORT NUMBER: SP1-2407-184-1

### Scotopic Flux vs. Wavelength



Scotopic Lumens: NR

S/P: 1.47

| λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(Φ/nm) |
|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|
| 360       | 0                           | NR               | 490       | 139                         | NR               | 620       | 607                         | NR               | 750       | 15                          | NR               | 880       | 0                           | NR               |
| 365       | 0                           | NR               | 495       | 198                         | NR               | 625       | 554                         | NR               | 755       | 13                          | NR               | 885       | 0                           | NR               |
| 370       | 0                           | NR               | 500       | 267                         | NR               | 630       | 504                         | NR               | 760       | 11                          | NR               | 890       | 0                           | NR               |
| 375       | 0                           | NR               | 505       | 343                         | NR               | 635       | 452                         | NR               | 765       | 10                          | NR               | 895       | 0                           | NR               |
| 380       | 0                           | NR               | 510       | 410                         | NR               | 640       | 403                         | NR               | 770       | 8                           | NR               | 900       | 0                           | NR               |
| 385       | 2                           | NR               | 515       | 470                         | NR               | 645       | 357                         | NR               | 775       | 7                           | NR               | 905       | 0                           | NR               |
| 390       | 4                           | NR               | 520       | 516                         | NR               | 650       | 314                         | NR               | 780       | 6                           | NR               | 910       | 0                           | NR               |
| 395       | 7                           | NR               | 525       | 550                         | NR               | 655       | 275                         | NR               | 785       | 5                           | NR               | 915       | 0                           | NR               |
| 400       | 10                          | NR               | 530       | 578                         | NR               | 660       | 240                         | NR               | 790       | 5                           | NR               | 920       | 0                           | NR               |
| 405       | 17                          | NR               | 535       | 601                         | NR               | 665       | 208                         | NR               | 795       | 4                           | NR               | 925       | 0                           | NR               |
| 410       | 35                          | NR               | 540       | 620                         | NR               | 670       | 179                         | NR               | 800       | 4                           | NR               | 930       | 0                           | NR               |
| 415       | 70                          | NR               | 545       | 641                         | NR               | 675       | 155                         | NR               | 805       | 3                           | NR               | 935       | 0                           | NR               |
| 420       | 147                         | NR               | 550       | 664                         | NR               | 680       | 133                         | NR               | 810       | 3                           | NR               | 940       | 0                           | NR               |
| 425       | 285                         | NR               | 555       | 689                         | NR               | 685       | 114                         | NR               | 815       | 2                           | NR               | 945       | 0                           | NR               |
| 430       | 487                         | NR               | 560       | 715                         | NR               | 690       | 98                          | NR               | 820       | 2                           | NR               | 950       | 0                           | NR               |
| 435       | 787                         | NR               | 565       | 743                         | NR               | 695       | 84                          | NR               | 825       | 2                           | NR               | 955       | 0                           | NR               |
| 440       | 1000                        | NR               | 570       | 771                         | NR               | 700       | 72                          | NR               | 830       | 2                           | NR               | 960       | 0                           | NR               |
| 445       | 783                         | NR               | 575       | 794                         | NR               | 705       | 61                          | NR               | 835       | 1                           | NR               | 965       | 0                           | NR               |
| 450       | 417                         | NR               | 580       | 811                         | NR               | 710       | 52                          | NR               | 840       | 1                           | NR               | 970       | 0                           | NR               |
| 455       | 261                         | NR               | 585       | 817                         | NR               | 715       | 45                          | NR               | 845       | 1                           | NR               | 975       | 0                           | NR               |
| 460       | 167                         | NR               | 590       | 815                         | NR               | 720       | 39                          | NR               | 850       | 1                           | NR               | 980       | 0                           | NR               |
| 465       | 104                         | NR               | 595       | 801                         | NR               | 725       | 33                          | NR               | 855       | 1                           | NR               | 985       | 0                           | NR               |
| 470       | 79                          | NR               | 600       | 777                         | NR               | 730       | 28                          | NR               | 860       | 1                           | NR               | 990       | 0                           | NR               |
| 475       | 73                          | NR               | 605       | 744                         | NR               | 735       | 24                          | NR               | 865       | 1                           | NR               | 995       | 0                           | NR               |
| 480       | 76                          | NR               | 610       | 704                         | NR               | 740       | 21                          | NR               | 870       | 1                           | NR               | 1000      | 0                           | NR               |
| 485       | 98                          | NR               | 615       | 657                         | NR               | 745       | 18                          | NR               | 875       | 1                           | NR               |           |                             |                  |

REPORT NUMBER: SP1-2407-184-1

### Melanopic Flux vs. Wavelength



Melanopic Lumens: NR

M/P: 2.78

| $\lambda$<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               | 139                                    | NR                             | 620               | 607                                    | NR                             | 750               | 15                                     | NR                             | 880               | 0                                      | NR                             |
| 365               | 0                                      | NR                             | 495               | 198                                    | NR                             | 625               | 554                                    | NR                             | 755               | 13                                     | NR                             | 885               | 0                                      | NR                             |
| 370               | 0                                      | NR                             | 500               | 267                                    | NR                             | 630               | 504                                    | NR                             | 760               | 11                                     | NR                             | 890               | 0                                      | NR                             |
| 375               | 0                                      | NR                             | 505               | 343                                    | NR                             | 635               | 452                                    | NR                             | 765               | 10                                     | NR                             | 895               | 0                                      | NR                             |
| 380               | 0                                      | NR                             | 510               | 410                                    | NR                             | 640               | 403                                    | NR                             | 770               | 8                                      | NR                             | 900               | 0                                      | NR                             |
| 385               | 2                                      | NR                             | 515               | 470                                    | NR                             | 645               | 357                                    | NR                             | 775               | 7                                      | NR                             | 905               | 0                                      | NR                             |
| 390               | 4                                      | NR                             | 520               | 516                                    | NR                             | 650               | 314                                    | NR                             | 780               | 6                                      | NR                             | 910               | 0                                      | NR                             |
| 395               | 7                                      | NR                             | 525               | 550                                    | NR                             | 655               | 275                                    | NR                             | 785               | 5                                      | NR                             | 915               | 0                                      | NR                             |
| 400               | 10                                     | NR                             | 530               | 578                                    | NR                             | 660               | 240                                    | NR                             | 790               | 5                                      | NR                             | 920               | 0                                      | NR                             |
| 405               | 17                                     | NR                             | 535               | 601                                    | NR                             | 665               | 208                                    | NR                             | 795               | 4                                      | NR                             | 925               | 0                                      | NR                             |
| 410               | 35                                     | NR                             | 540               | 620                                    | NR                             | 670               | 179                                    | NR                             | 800               | 4                                      | NR                             | 930               | 0                                      | NR                             |
| 415               | 70                                     | NR                             | 545               | 641                                    | NR                             | 675               | 155                                    | NR                             | 805               | 3                                      | NR                             | 935               | 0                                      | NR                             |
| 420               | 147                                    | NR                             | 550               | 664                                    | NR                             | 680               | 133                                    | NR                             | 810               | 3                                      | NR                             | 940               | 0                                      | NR                             |
| 425               | 285                                    | NR                             | 555               | 689                                    | NR                             | 685               | 114                                    | NR                             | 815               | 2                                      | NR                             | 945               | 0                                      | NR                             |
| 430               | 487                                    | NR                             | 560               | 715                                    | NR                             | 690               | 98                                     | NR                             | 820               | 2                                      | NR                             | 950               | 0                                      | NR                             |
| 435               | 787                                    | NR                             | 565               | 743                                    | NR                             | 695               | 84                                     | NR                             | 825               | 2                                      | NR                             | 955               | 0                                      | NR                             |
| 440               | 1000                                   | NR                             | 570               | 771                                    | NR                             | 700               | 72                                     | NR                             | 830               | 2                                      | NR                             | 960               | 0                                      | NR                             |
| 445               | 783                                    | NR                             | 575               | 794                                    | NR                             | 705               | 61                                     | NR                             | 835               | 1                                      | NR                             | 965               | 0                                      | NR                             |
| 450               | 417                                    | NR                             | 580               | 811                                    | NR                             | 710               | 52                                     | NR                             | 840               | 1                                      | NR                             | 970               | 0                                      | NR                             |
| 455               | 261                                    | NR                             | 585               | 817                                    | NR                             | 715               | 45                                     | NR                             | 845               | 1                                      | NR                             | 975               | 0                                      | NR                             |
| 460               | 167                                    | NR                             | 590               | 815                                    | NR                             | 720               | 39                                     | NR                             | 850               | 1                                      | NR                             | 980               | 0                                      | NR                             |
| 465               | 104                                    | NR                             | 595               | 801                                    | NR                             | 725               | 33                                     | NR                             | 855               | 1                                      | NR                             | 985               | 0                                      | NR                             |
| 470               | 79                                     | NR                             | 600               | 777                                    | NR                             | 730               | 28                                     | NR                             | 860               | 1                                      | NR                             | 990               | 0                                      | NR                             |
| 475               | 73                                     | NR                             | 605               | 744                                    | NR                             | 735               | 24                                     | NR                             | 865               | 1                                      | NR                             | 995               | 0                                      | NR                             |
| 480               | 76                                     | NR                             | 610               | 704                                    | NR                             | 740               | 21                                     | NR                             | 870               | 1                                      | NR                             | 1000              | 0                                      | NR                             |
| 485               | 98                                     | NR                             | 615               | 657                                    | NR                             | 745               | 18                                     | NR                             | 875               | 1                                      | NR                             |                   |                                        |                                |

REPORT NUMBER: SP1-2407-184-1

TM-30-18

### Summary

$R_f = 71.8$   
 $R_g = 96.5$   
 $CIE R_a = 70.7$   
 $R_g = -36.7$



### Color Vector Graphics



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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 56 | CES51 = 86 | CES76 = 48 |
| CES02 = 61 | CES27 = 79 | CES52 = 88 | CES77 = 71 |
| CES03 = 30 | CES28 = 80 | CES53 = 73 | CES78 = 52 |
| CES04 = 70 | CES29 = 49 | CES54 = 79 | CES79 = 79 |
| CES05 = 47 | CES30 = 53 | CES55 = 77 | CES80 = 77 |
| CES06 = 50 | CES31 = 55 | CES56 = 67 | CES81 = 75 |
| CES07 = 40 | CES32 = 53 | CES57 = 64 | CES82 = 90 |
| CES08 = 39 | CES33 = 59 | CES58 = 67 | CES83 = 84 |
| CES09 = 29 | CES34 = 67 | CES59 = 87 | CES84 = 89 |
| CES10 = 74 | CES35 = 82 | CES60 = 91 | CES85 = 86 |
| CES11 = 57 | CES36 = 86 | CES61 = 87 | CES86 = 71 |
| CES12 = 63 | CES37 = 76 | CES62 = 76 | CES87 = 78 |
| CES13 = 42 | CES38 = 62 | CES63 = 73 | CES88 = 76 |
| CES14 = 74 | CES39 = 91 | CES64 = 71 | CES89 = 72 |
| CES15 = 71 | CES40 = 84 | CES65 = 64 | CES90 = 72 |
| CES16 = 46 | CES41 = 81 | CES66 = 67 | CES91 = 97 |
| CES17 = 49 | CES42 = 76 | CES67 = 65 | CES92 = 66 |
| CES18 = 56 | CES43 = 71 | CES68 = 72 | CES93 = 81 |
| CES19 = 72 | CES44 = 98 | CES69 = 82 | CES94 = 55 |
| CES20 = 65 | CES45 = 80 | CES70 = 61 | CES95 = 73 |
| CES21 = 86 | CES46 = 76 | CES71 = 59 | CES96 = 78 |
| CES22 = 78 | CES47 = 71 | CES72 = 86 | CES97 = 83 |
| CES23 = 92 | CES48 = 61 | CES73 = 52 | CES98 = 72 |
| CES24 = 91 | CES49 = 76 | CES74 = 93 | CES99 = 60 |
| CES25 = 72 | CES50 = 84 | CES75 = 56 |            |



Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)