

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: LUMARK

Report Number: P1067083

Luminaire Tested: **NAV-SA2C-827-U-T3BC**

Issue Date: 08/07/2025

**Test Information**

Test Method: LM-79-08  
Report Number: P1067083  
Test Lab: INNOVATION CENTER(G3)  
Issue Date: 08/07/2025  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: LUMARK  
Catalog Number: NAV-SA2C-827-U-T3BC  
Description: Navion AREA AND ROADWAY LUMINAIRE 1050mA 2xLight Square PACKAGE  
80CRI 2700K FIXTURE w/ TYPE III ANGLED BACKLIGHT CONTROL  
Light Source: (28) 2700K CCT, 80 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 8578.9 lumens  
Efficiency: N/A  
Efficacy: 89.2 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 1' x H: 0')  
IES Classification: Type III - Short  
BUG Rating: B0 - U0 - G2

Input Watts (W): 96.2  
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

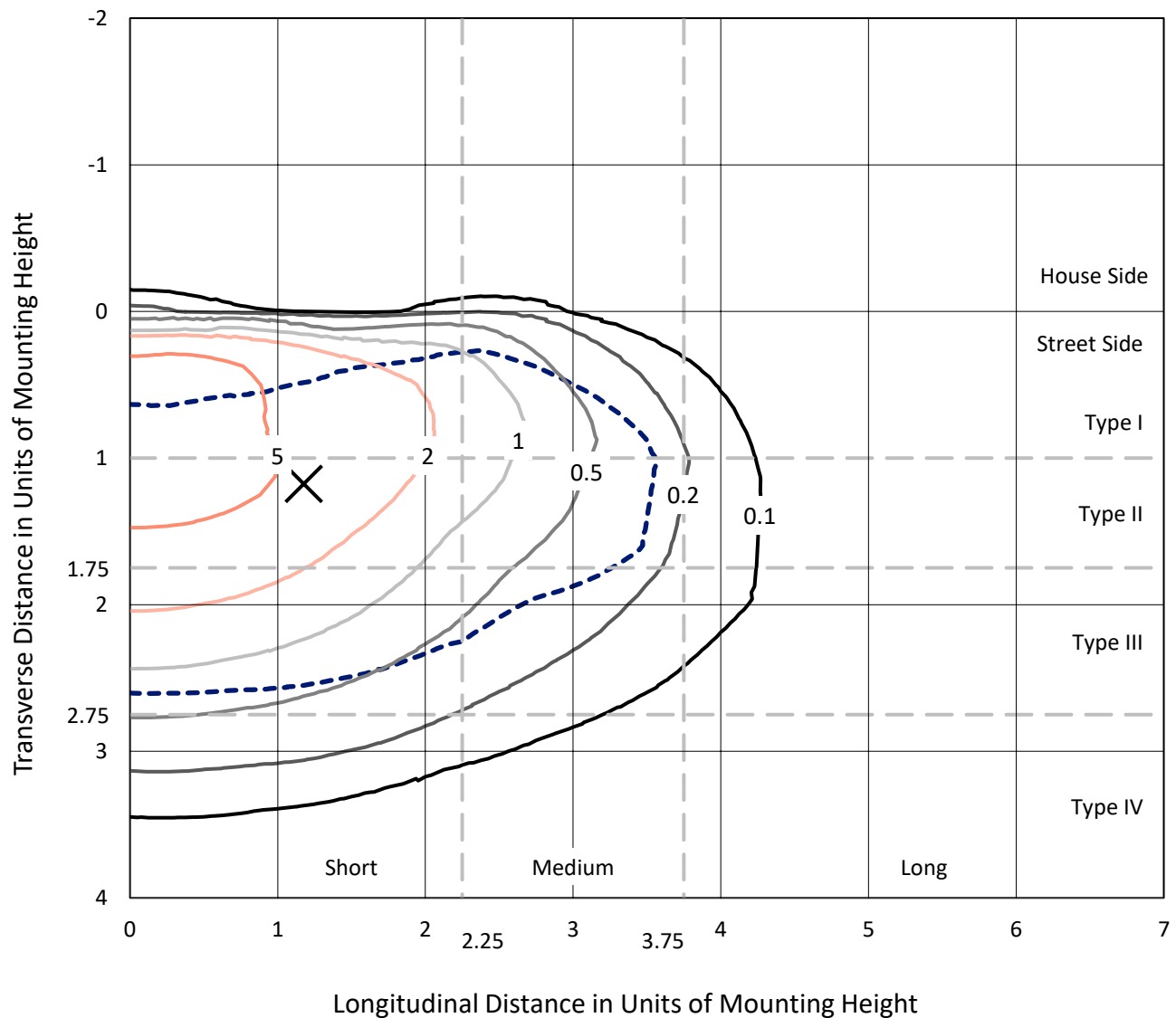


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## Iso-Footcandle Lines of Horizontal Illumination

× Max cd  
 --- 1/2 Max cd

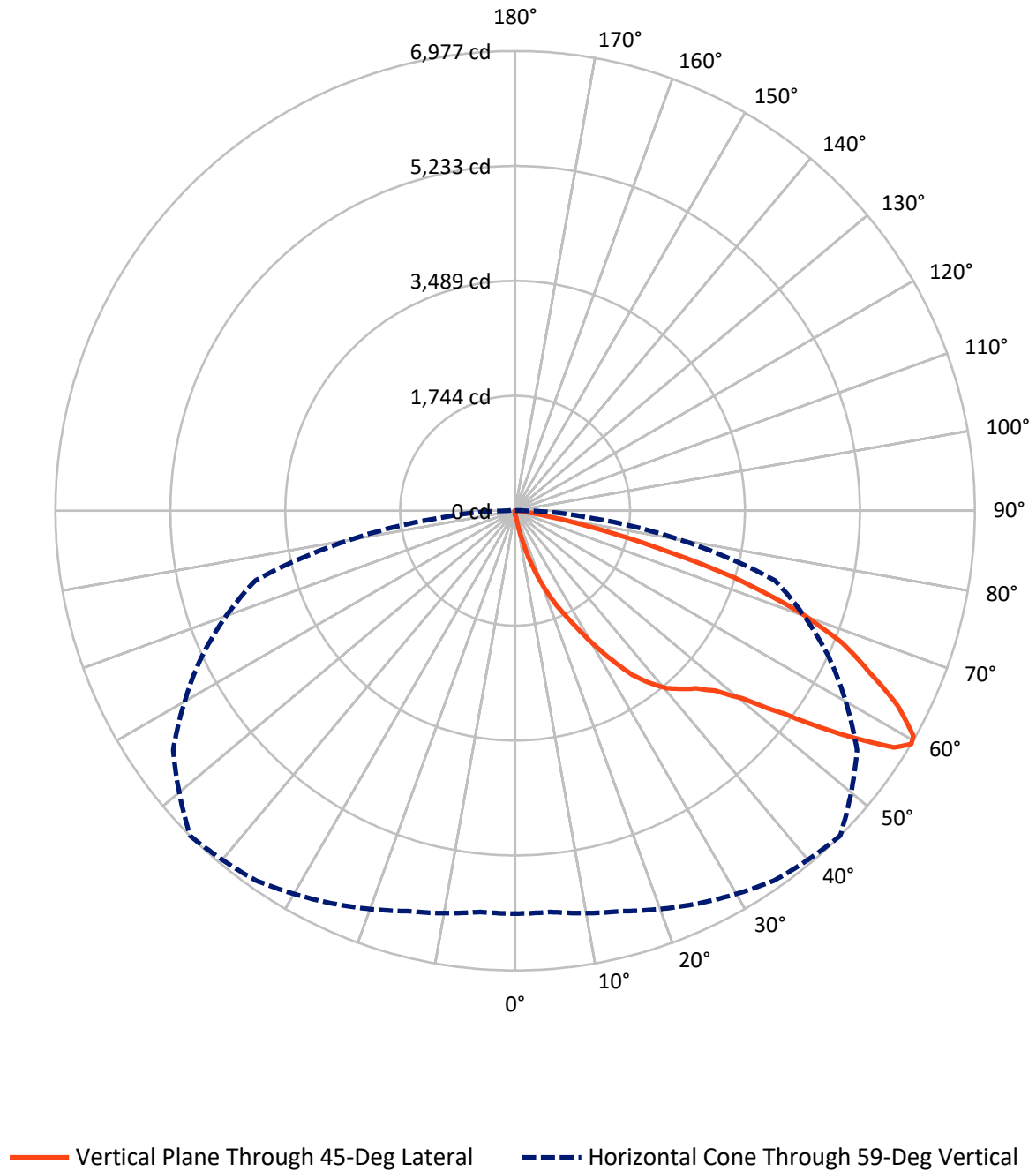


Based on 15 foot mounting height. Maximum calculated value = 9.4 fc  
 Type III - Short - N/A

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## Luminous Intensity Polar Plot



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**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 30.5     | 0.0    | 30.5   |
|                    | % Fixture | 0.4      | 0.0    | 0.4    |
| <b>Street Side</b> | Lumens    | 8548.5   | 0.0    | 8548.5 |
|                    | % Fixture | 99.6     | 0.0    | 99.6   |
| <b>Total</b>       | Lumens    | 8578.9   | 0.0    | 8578.9 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**Coefficient of Utilization**

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 8.0    | 0.1       |
| 10°-20°   | 94.8   | 1.1       |
| 20°-30°   | 340.7  | 4.0       |
| 30°-40°   | 791.7  | 9.2       |
| 40°-50°   | 1349.4 | 15.7      |
| 50°-60°   | 2223.5 | 25.9      |
| 60°-70°   | 2570.8 | 30.0      |
| 70°-80°   | 1104.5 | 12.9      |
| 80°-90°   | 95.4   | 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°    | 8578.9 | 100.0     |
| 0°-180°   | 8578.9 | 100.0     |



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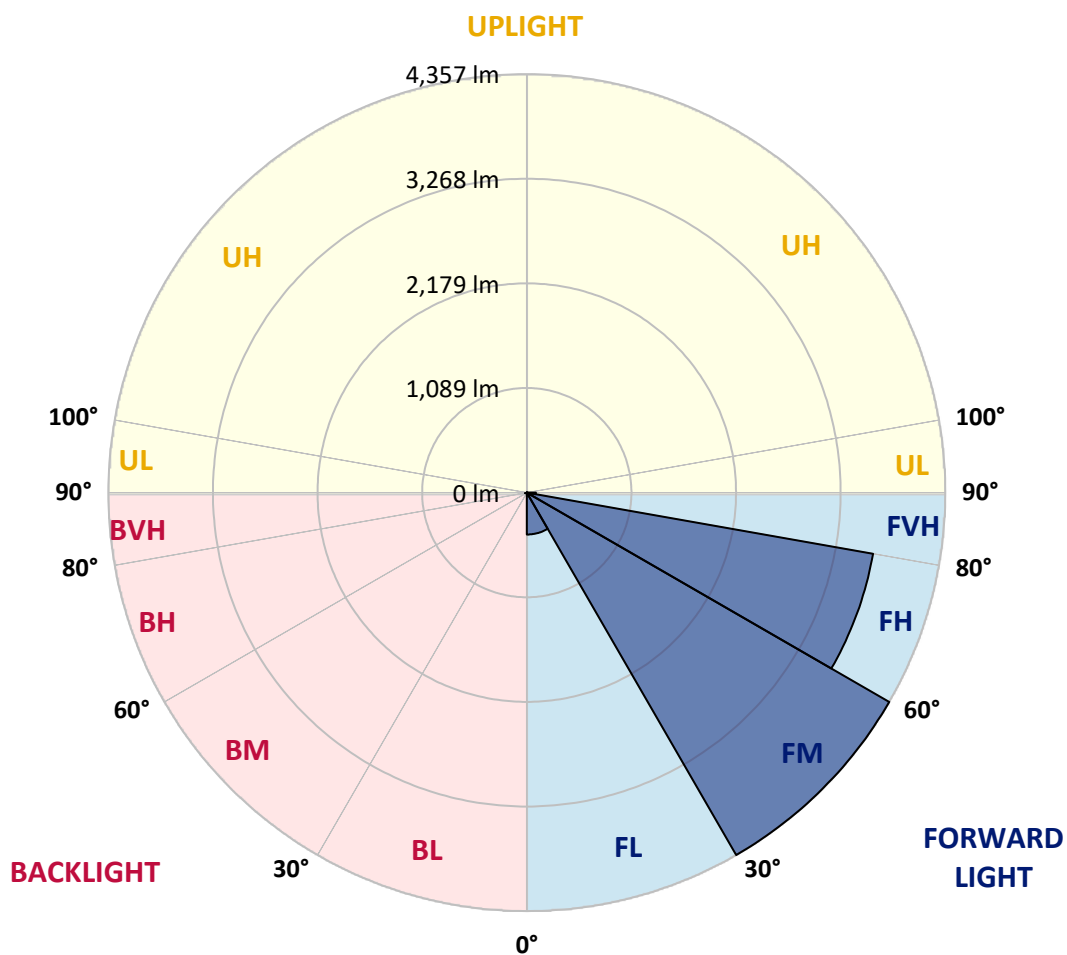
CATALOG NUMBER: NAV-SA2C-827-U-T3BC

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 436.0  | 5.1       |                         |      |         |
| FM   | (30°-60°)   | 4357.3 | 50.8      |                         |      |         |
| FH   | (60°-80°)   | 3661.0 | 42.7      |                         |      | G2/5000 |
| FVH  | (80°-90°)   | 94.2   | 1.1       |                         |      | G1/100  |
| BL   | (0°-30°)    | 7.5    | 0.1       | B0/110                  |      |         |
| BM   | (30°-60°)   | 7.4    | 0.1       | B0/220                  |      |         |
| BH   | (60°-80°)   | 14.3   | 0.2       | B0/110                  |      | G0/110  |
| BVH  | (80°-90°)   | 1.2    | 0.0       |                         |      | G0/10   |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B0-U0-G2**

Type III Short



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 44°    | 45°    | 55°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 54.2   | 54.2   | 54.2   | 54.2   | 54.2   | 54.2   | 54.2   | 54.2   | 54.2   | 54.2   | 54.2   |
| 2.5°  | 70.4   | 70.4   | 68.6   | 66.3   | 65.8   | 64.0   | 64.0   | 62.3   | 60.0   | 58.3   | 56.0   |
| 5°    | 102.1  | 101.5  | 96.9   | 91.1   | 83.6   | 79.0   | 79.0   | 72.7   | 66.9   | 61.7   | 57.1   |
| 7.5°  | 223.2  | 218.0  | 201.3  | 173.6  | 137.3  | 113.1  | 111.3  | 90.6   | 76.7   | 66.3   | 57.7   |
| 10°   | 512.2  | 494.4  | 470.7  | 404.4  | 298.8  | 208.8  | 204.8  | 132.1  | 91.7   | 71.5   | 58.8   |
| 12.5° | 839.3  | 853.7  | 806.4  | 702.0  | 578.6  | 430.3  | 401.5  | 222.7  | 121.1  | 78.5   | 60.0   |
| 15°   | 1137.0 | 1133.5 | 1107.0 | 1021.6 | 879.1  | 681.8  | 664.0  | 387.1  | 173.6  | 89.4   | 61.1   |
| 17.5° | 1359.6 | 1355.6 | 1330.2 | 1275.4 | 1165.8 | 968.5  | 953.0  | 617.2  | 272.3  | 105.0  | 62.3   |
| 20°   | 1594.4 | 1589.2 | 1553.5 | 1509.6 | 1413.9 | 1246.0 | 1227.5 | 874.5  | 426.3  | 130.4  | 62.3   |
| 22.5° | 1875.9 | 1866.1 | 1828.0 | 1753.6 | 1652.7 | 1506.7 | 1490.0 | 1137.5 | 617.2  | 171.9  | 65.2   |
| 25°   | 2216.3 | 2199.5 | 2147.0 | 2080.1 | 1958.4 | 1764.6 | 1746.7 | 1430.6 | 847.4  | 234.8  | 68.1   |
| 27.5° | 2604.5 | 2607.4 | 2536.4 | 2423.3 | 2260.1 | 2062.2 | 2028.8 | 1693.1 | 1085.6 | 324.8  | 71.5   |
| 30°   | 3065.4 | 3036.5 | 2936.7 | 2805.2 | 2646.6 | 2394.5 | 2362.2 | 1954.4 | 1353.3 | 457.4  | 77.3   |
| 32.5° | 3496.9 | 3465.7 | 3331.3 | 3165.8 | 2995.6 | 2729.7 | 2703.1 | 2248.0 | 1596.7 | 614.3  | 87.7   |
| 35°   | 3867.2 | 3845.3 | 3657.2 | 3455.3 | 3304.2 | 3066.5 | 3058.5 | 2575.6 | 1882.8 | 783.4  | 99.2   |
| 37.5° | 4193.1 | 4153.3 | 3911.6 | 3702.2 | 3548.8 | 3335.9 | 3318.6 | 2875.6 | 2158.6 | 979.5  | 116.5  |
| 40°   | 4471.2 | 4449.2 | 4154.5 | 3879.3 | 3754.7 | 3564.4 | 3542.4 | 3138.6 | 2443.5 | 1207.3 | 137.9  |
| 42.5° | 4768.8 | 4740.0 | 4453.9 | 4145.2 | 3915.7 | 3712.0 | 3697.6 | 3355.5 | 2697.4 | 1457.7 | 169.6  |
| 45°   | 5105.1 | 5051.5 | 4800.5 | 4523.7 | 4174.7 | 3864.9 | 3848.7 | 3548.8 | 2957.5 | 1726.5 | 208.2  |
| 47.5° | 5464.5 | 5417.8 | 5214.7 | 5020.3 | 4618.8 | 4117.0 | 4082.4 | 3713.2 | 3215.9 | 2036.9 | 257.3  |
| 50°   | 5830.2 | 5831.4 | 5679.1 | 5585.6 | 5161.7 | 4526.5 | 4477.5 | 3954.9 | 3487.6 | 2369.1 | 330.0  |
| 52.5° | 6255.9 | 6266.9 | 6264.6 | 6195.4 | 5866.6 | 5196.3 | 5130.5 | 4321.8 | 3803.2 | 2756.8 | 430.3  |
| 55°   | 6434.2 | 6453.8 | 6581.3 | 6734.7 | 6645.3 | 6045.4 | 5975.0 | 4954.6 | 4221.4 | 3188.8 | 579.2  |
| 57.5° | 6288.2 | 6310.2 | 6486.1 | 6754.9 | 6960.3 | 6789.0 | 6780.9 | 5778.3 | 4772.3 | 3712.6 | 822.6  |
| 59°   | 6114.6 | 6111.7 | 6292.3 | 6577.2 | 6854.1 | 6965.5 | 6977.0 | 6335.5 | 5252.2 | 4080.1 | 1032.6 |
| 60°   | 5999.2 | 6001.6 | 6121.5 | 6414.0 | 6708.2 | 6901.4 | 6946.4 | 6663.8 | 5532.6 | 4344.3 | 1212.5 |
| 62.5° | 5553.9 | 5580.5 | 5675.6 | 5947.3 | 6226.5 | 6442.3 | 6519.0 | 6956.2 | 6335.0 | 4968.4 | 1838.4 |
| 65°   | 5069.9 | 5071.7 | 5207.2 | 5439.7 | 5707.4 | 5859.1 | 5907.5 | 6501.1 | 6870.9 | 5604.1 | 2659.3 |
| 67.5° | 4206.4 | 4241.6 | 4395.6 | 4772.3 | 5125.9 | 5318.0 | 5354.9 | 5658.9 | 6648.8 | 6018.3 | 3070.6 |
| 70°   | 2943.7 | 2989.8 | 3209.6 | 3698.2 | 4224.9 | 4540.4 | 4538.1 | 4704.2 | 5851.6 | 5833.7 | 2603.3 |
| 72.5° | 1469.8 | 1549.4 | 1728.8 | 2252.0 | 2890.0 | 3385.5 | 3489.9 | 3784.1 | 4700.8 | 4845.5 | 1942.3 |
| 75°   | 649.5  | 654.1  | 756.3  | 1019.9 | 1436.4 | 2065.7 | 2159.2 | 3003.7 | 3606.5 | 3367.7 | 1402.9 |
| 77.5° | 377.8  | 381.3  | 399.8  | 458.0  | 582.0  | 1012.4 | 1117.4 | 1969.9 | 2548.5 | 1957.3 | 914.9  |
| 80°   | 137.3  | 140.8  | 140.2  | 173.6  | 255.0  | 398.6  | 444.2  | 954.7  | 1700.0 | 1030.8 | 479.4  |
| 82.5° | 84.2   | 84.2   | 81.3   | 81.9   | 92.9   | 152.9  | 167.3  | 406.7  | 827.8  | 507.6  | 137.3  |
| 85°   | 41.5   | 43.8   | 46.7   | 52.5   | 62.3   | 75.6   | 80.2   | 116.5  | 278.6  | 122.9  | 32.9   |
| 87.5° | 24.8   | 25.4   | 27.7   | 33.5   | 41.5   | 54.2   | 57.7   | 79.0   | 99.8   | 82.5   | 8.1    |
| 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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**CANDELA DISTRIBUTION (continued):**

|       | 90°   | 95°  | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|-------|-------|------|------|------|------|------|------|------|------|------|------|
| 0°    | 54.2  | 54.2 | 54.2 | 54.2 | 54.2 | 54.2 | 54.2 | 54.2 | 54.2 | 54.2 | 54.2 |
| 2.5°  | 54.8  | 54.2 | 51.3 | 49.0 | 46.7 | 44.4 | 42.7 | 41.0 | 41.0 | 41.5 | 41.0 |
| 5°    | 54.8  | 52.5 | 47.9 | 43.8 | 40.4 | 37.5 | 34.6 | 32.3 | 31.7 | 31.7 | 32.3 |
| 7.5°  | 54.2  | 51.3 | 45.0 | 39.8 | 35.2 | 31.1 | 28.3 | 25.4 | 24.8 | 25.4 | 24.8 |
| 10°   | 53.6  | 50.2 | 42.7 | 36.3 | 30.0 | 26.0 | 21.9 | 19.0 | 19.0 | 19.0 | 19.6 |
| 12.5° | 53.6  | 48.5 | 40.4 | 32.9 | 26.0 | 21.3 | 17.3 | 14.4 | 13.8 | 13.8 | 13.8 |
| 15°   | 53.1  | 47.3 | 38.1 | 28.8 | 21.9 | 16.2 | 12.7 | 9.8  | 9.8  | 9.8  | 9.8  |
| 17.5° | 51.9  | 45.6 | 35.2 | 25.4 | 17.3 | 12.1 | 8.7  | 5.8  | 5.8  | 6.9  | 6.9  |
| 20°   | 50.8  | 43.8 | 31.7 | 20.8 | 14.4 | 9.2  | 5.8  | 3.5  | 3.5  | 5.2  | 5.8  |
| 22.5° | 51.3  | 43.8 | 29.4 | 18.5 | 11.5 | 6.9  | 4.6  | 2.9  | 2.3  | 4.0  | 5.2  |
| 25°   | 51.9  | 42.7 | 26.5 | 16.2 | 8.7  | 5.2  | 3.5  | 1.2  | 0.6  | 1.2  | 1.7  |
| 27.5° | 51.9  | 41.5 | 23.1 | 12.7 | 6.3  | 4.0  | 1.7  | 0.0  | 0.0  | 0.0  | 0.0  |
| 30°   | 51.3  | 39.8 | 20.2 | 10.4 | 4.6  | 2.3  | 0.6  | 0.0  | 0.0  | 0.0  | 0.0  |
| 32.5° | 50.8  | 38.1 | 18.5 | 8.1  | 4.0  | 1.2  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 35°   | 51.3  | 35.8 | 16.2 | 6.3  | 2.3  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 1.2  |
| 37.5° | 53.1  | 33.5 | 13.8 | 5.2  | 1.7  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 40°   | 55.4  | 31.7 | 11.5 | 4.0  | 0.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 42.5° | 60.0  | 31.7 | 10.4 | 2.9  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 45°   | 65.8  | 31.7 | 8.7  | 2.3  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 47.5° | 73.3  | 32.3 | 7.5  | 2.3  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 50°   | 82.5  | 33.5 | 6.9  | 1.7  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 52.5° | 89.4  | 32.3 | 6.3  | 1.7  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 55°   | 101.5 | 31.1 | 5.8  | 1.2  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 57.5° | 117.7 | 29.4 | 5.8  | 0.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 59°   | 133.8 | 27.1 | 5.8  | 0.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 60°   | 152.3 | 26.0 | 5.2  | 0.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 62.5° | 251.5 | 23.1 | 4.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 65°   | 485.7 | 21.9 | 4.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 67.5° | 785.1 | 21.9 | 2.9  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 70°   | 825.5 | 21.9 | 2.3  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 72.5° | 549.2 | 17.9 | 1.7  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 75°   | 294.2 | 16.2 | 1.7  | 0.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 77.5° | 158.6 | 15.0 | 2.3  | 1.2  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 80°   | 69.8  | 11.0 | 2.9  | 1.7  | 1.2  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 82.5° | 27.7  | 7.5  | 3.5  | 2.9  | 2.3  | 1.2  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 85°   | 13.3  | 5.8  | 4.6  | 4.0  | 2.9  | 1.7  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 87.5° | 6.3   | 5.8  | 5.2  | 4.6  | 4.0  | 2.9  | 0.6  | 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: SP1-2407-184-8

Test Date: 10/10/2024

Luminaire Tested: GSS-SB1A-827-U-5WQ

Data in this report applies to families of products including GSS-SB1A-827-U-5WQ

### Test Information

Test Method: LM-79-2019  
 Report Number: SP1-2407-184-8  
 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-827-U-5WQ**  
 Description: GALLEON II SITE SLIM 1SQ 350MA 5WQ HIGH DENSITY LIGHTSQUARE WITH 80 CRI  
 2700K CCT 26 LEDS

### Spectral Parameters

CCT (K): 2756  
 CIE  $u'$ : 0.2599  
 CIE  $v'$ : 0.5271  
 Duv: 0.0006  
 CIE x: 0.4563  
 CIE y: 0.4112  
 CIE z: 0.1325  
 Peak Wavelength (nm): 609  
 Dominant Wavelength (nm): 583  
 Purity: 60.41121  
 R<sub>f</sub>: 82.2  
 R<sub>g</sub>: 99.9

CRI (Ra): 82.9  
 R1: 81.6  
 R2: 88.8  
 R3: 96.0  
 R4: 83.4  
 R5: 81.4  
 R6: 87.0  
 R7: 84.0  
 R8: 60.8  
 R9: 10.8  
 R10: 74.8  
 R11: 84.3  
 R12: 72.1  
 R13: 82.9  
 R14: 97.3  
 R15: 73.7



### Test Conditions

Stabilization Time: 29M  
 Operation Time: 1H 29M  
 Sphere Temperature (°C): 25.2

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| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | IN0058                | 6/18/2024        | 12/18/2024           |
| Power Meter                    | INXT2011004           | 2/8/2024         | 2/8/2025             |
| AC Power Source                | IN0063                | 10/24/2023       | 10/24/2024           |
| DC Power Source                | IN0208                | 10/24/2023       | 10/24/2024           |
| Sphere Thermometer             | IN0085                | 10/24/2023       | 10/24/2024           |
| Room Thermometer               | IN0046                | 10/24/2023       | 10/24/2024           |

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**CIE 1931 Chromaticity Diagram**



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



Point lies inside the ANSI 2700K 4-step quadrangle

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### 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               | 158                                    | NR                             | 620               | 959                                    | NR                             | 750               | 35                                     | NR                             | 880               | 1                                      | NR                             |
| 365               | 0                                      | NR                             | 495               | 211                                    | NR                             | 625               | 918                                    | NR                             | 755               | 30                                     | NR                             | 885               | 1                                      | NR                             |
| 370               | 0                                      | NR                             | 500               | 264                                    | NR                             | 630               | 873                                    | NR                             | 760               | 26                                     | NR                             | 890               | 1                                      | NR                             |
| 375               | 0                                      | NR                             | 505               | 318                                    | NR                             | 635               | 816                                    | NR                             | 765               | 22                                     | NR                             | 895               | 1                                      | NR                             |
| 380               | 0                                      | NR                             | 510               | 363                                    | NR                             | 640               | 755                                    | NR                             | 770               | 19                                     | NR                             | 900               | 1                                      | NR                             |
| 385               | 0                                      | NR                             | 515               | 403                                    | NR                             | 645               | 689                                    | NR                             | 775               | 16                                     | NR                             | 905               | 1                                      | NR                             |
| 390               | 0                                      | NR                             | 520               | 435                                    | NR                             | 650               | 626                                    | NR                             | 780               | 14                                     | NR                             | 910               | 0                                      | NR                             |
| 395               | 1                                      | NR                             | 525               | 459                                    | NR                             | 655               | 564                                    | NR                             | 785               | 12                                     | NR                             | 915               | 0                                      | NR                             |
| 400               | 3                                      | NR                             | 530               | 481                                    | NR                             | 660               | 503                                    | NR                             | 790               | 10                                     | NR                             | 920               | 0                                      | NR                             |
| 405               | 6                                      | NR                             | 535               | 501                                    | NR                             | 665               | 447                                    | NR                             | 795               | 9                                      | NR                             | 925               | 0                                      | NR                             |
| 410               | 13                                     | NR                             | 540               | 519                                    | NR                             | 670               | 392                                    | NR                             | 800               | 8                                      | NR                             | 930               | 0                                      | NR                             |
| 415               | 26                                     | NR                             | 545               | 542                                    | NR                             | 675               | 343                                    | NR                             | 805               | 7                                      | NR                             | 935               | 0                                      | NR                             |
| 420               | 51                                     | NR                             | 550               | 565                                    | NR                             | 680               | 299                                    | NR                             | 810               | 6                                      | NR                             | 940               | 0                                      | NR                             |
| 425               | 93                                     | NR                             | 555               | 593                                    | NR                             | 685               | 260                                    | NR                             | 815               | 5                                      | NR                             | 945               | 0                                      | NR                             |
| 430               | 156                                    | NR                             | 560               | 624                                    | NR                             | 690               | 225                                    | NR                             | 820               | 4                                      | NR                             | 950               | 0                                      | NR                             |
| 435               | 250                                    | NR                             | 565               | 662                                    | NR                             | 695               | 194                                    | NR                             | 825               | 4                                      | NR                             | 955               | 0                                      | NR                             |
| 440               | 391                                    | NR                             | 570               | 707                                    | NR                             | 700               | 166                                    | NR                             | 830               | 3                                      | NR                             | 960               | 0                                      | NR                             |
| 445               | 460                                    | NR                             | 575               | 756                                    | NR                             | 705               | 143                                    | NR                             | 835               | 3                                      | NR                             | 965               | 0                                      | NR                             |
| 450               | 293                                    | NR                             | 580               | 810                                    | NR                             | 710               | 122                                    | NR                             | 840               | 2                                      | NR                             | 970               | 0                                      | NR                             |
| 455               | 188                                    | NR                             | 585               | 860                                    | NR                             | 715               | 105                                    | NR                             | 845               | 2                                      | NR                             | 975               | 0                                      | NR                             |
| 460               | 149                                    | NR                             | 590               | 910                                    | NR                             | 720               | 90                                     | NR                             | 850               | 2                                      | NR                             | 980               | 0                                      | NR                             |
| 465               | 103                                    | NR                             | 595               | 950                                    | NR                             | 725               | 77                                     | NR                             | 855               | 2                                      | NR                             | 985               | 0                                      | NR                             |
| 470               | 80                                     | NR                             | 600               | 980                                    | NR                             | 730               | 66                                     | NR                             | 860               | 1                                      | NR                             | 990               | 0                                      | NR                             |
| 475               | 82                                     | NR                             | 605               | 995                                    | NR                             | 735               | 56                                     | NR                             | 865               | 1                                      | NR                             | 995               | 0                                      | NR                             |
| 480               | 92                                     | NR                             | 610               | 998                                    | NR                             | 740               | 48                                     | NR                             | 870               | 1                                      | NR                             | 1000              | 0                                      | NR                             |
| 485               | 116                                    | NR                             | 615               | 985                                    | NR                             | 745               | 41                                     | NR                             | 875               | 1                                      | NR                             |                   |                                        |                                |

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### Scotopic Flux vs. Wavelength



Scotopic Lumens: NR

S/P: 1.2

| $\lambda$<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               | 158                                  | NR                             | 620               | 959                                  | NR                             | 750               | 35                                   | NR                             | 880               | 1                                    | NR                             |
| 365               | 0                                    | NR                             | 495               | 211                                  | NR                             | 625               | 918                                  | NR                             | 755               | 30                                   | NR                             | 885               | 1                                    | NR                             |
| 370               | 0                                    | NR                             | 500               | 264                                  | NR                             | 630               | 873                                  | NR                             | 760               | 26                                   | NR                             | 890               | 1                                    | NR                             |
| 375               | 0                                    | NR                             | 505               | 318                                  | NR                             | 635               | 816                                  | NR                             | 765               | 22                                   | NR                             | 895               | 1                                    | NR                             |
| 380               | 0                                    | NR                             | 510               | 363                                  | NR                             | 640               | 755                                  | NR                             | 770               | 19                                   | NR                             | 900               | 1                                    | NR                             |
| 385               | 0                                    | NR                             | 515               | 403                                  | NR                             | 645               | 689                                  | NR                             | 775               | 16                                   | NR                             | 905               | 1                                    | NR                             |
| 390               | 0                                    | NR                             | 520               | 435                                  | NR                             | 650               | 626                                  | NR                             | 780               | 14                                   | NR                             | 910               | 0                                    | NR                             |
| 395               | 1                                    | NR                             | 525               | 459                                  | NR                             | 655               | 564                                  | NR                             | 785               | 12                                   | NR                             | 915               | 0                                    | NR                             |
| 400               | 3                                    | NR                             | 530               | 481                                  | NR                             | 660               | 503                                  | NR                             | 790               | 10                                   | NR                             | 920               | 0                                    | NR                             |
| 405               | 6                                    | NR                             | 535               | 501                                  | NR                             | 665               | 447                                  | NR                             | 795               | 9                                    | NR                             | 925               | 0                                    | NR                             |
| 410               | 13                                   | NR                             | 540               | 519                                  | NR                             | 670               | 392                                  | NR                             | 800               | 8                                    | NR                             | 930               | 0                                    | NR                             |
| 415               | 26                                   | NR                             | 545               | 542                                  | NR                             | 675               | 343                                  | NR                             | 805               | 7                                    | NR                             | 935               | 0                                    | NR                             |
| 420               | 51                                   | NR                             | 550               | 565                                  | NR                             | 680               | 299                                  | NR                             | 810               | 6                                    | NR                             | 940               | 0                                    | NR                             |
| 425               | 93                                   | NR                             | 555               | 593                                  | NR                             | 685               | 260                                  | NR                             | 815               | 5                                    | NR                             | 945               | 0                                    | NR                             |
| 430               | 156                                  | NR                             | 560               | 624                                  | NR                             | 690               | 225                                  | NR                             | 820               | 4                                    | NR                             | 950               | 0                                    | NR                             |
| 435               | 250                                  | NR                             | 565               | 662                                  | NR                             | 695               | 194                                  | NR                             | 825               | 4                                    | NR                             | 955               | 0                                    | NR                             |
| 440               | 391                                  | NR                             | 570               | 707                                  | NR                             | 700               | 166                                  | NR                             | 830               | 3                                    | NR                             | 960               | 0                                    | NR                             |
| 445               | 460                                  | NR                             | 575               | 756                                  | NR                             | 705               | 143                                  | NR                             | 835               | 3                                    | NR                             | 965               | 0                                    | NR                             |
| 450               | 293                                  | NR                             | 580               | 810                                  | NR                             | 710               | 122                                  | NR                             | 840               | 2                                    | NR                             | 970               | 0                                    | NR                             |
| 455               | 188                                  | NR                             | 585               | 860                                  | NR                             | 715               | 105                                  | NR                             | 845               | 2                                    | NR                             | 975               | 0                                    | NR                             |
| 460               | 149                                  | NR                             | 590               | 910                                  | NR                             | 720               | 90                                   | NR                             | 850               | 2                                    | NR                             | 980               | 0                                    | NR                             |
| 465               | 103                                  | NR                             | 595               | 950                                  | NR                             | 725               | 77                                   | NR                             | 855               | 2                                    | NR                             | 985               | 0                                    | NR                             |
| 470               | 80                                   | NR                             | 600               | 980                                  | NR                             | 730               | 66                                   | NR                             | 860               | 1                                    | NR                             | 990               | 0                                    | NR                             |
| 475               | 82                                   | NR                             | 605               | 995                                  | NR                             | 735               | 56                                   | NR                             | 865               | 1                                    | NR                             | 995               | 0                                    | NR                             |
| 480               | 92                                   | NR                             | 610               | 998                                  | NR                             | 740               | 48                                   | NR                             | 870               | 1                                    | NR                             | 1000              | 0                                    | NR                             |
| 485               | 116                                  | NR                             | 615               | 985                                  | NR                             | 745               | 41                                   | NR                             | 875               | 1                                    | NR                             |                   |                                      |                                |

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### Melanopic Flux vs. Wavelength


**Melanopic Lumens: NR**
**M/P: 2.16**

| $\lambda$<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               | 158                                  | NR                             | 620               | 959                                  | NR                             | 750               | 35                                   | NR                             | 880               | 1                                    | NR                             |
| 365               | 0                                    | NR                             | 495               | 211                                  | NR                             | 625               | 918                                  | NR                             | 755               | 30                                   | NR                             | 885               | 1                                    | NR                             |
| 370               | 0                                    | NR                             | 500               | 264                                  | NR                             | 630               | 873                                  | NR                             | 760               | 26                                   | NR                             | 890               | 1                                    | NR                             |
| 375               | 0                                    | NR                             | 505               | 318                                  | NR                             | 635               | 816                                  | NR                             | 765               | 22                                   | NR                             | 895               | 1                                    | NR                             |
| 380               | 0                                    | NR                             | 510               | 363                                  | NR                             | 640               | 755                                  | NR                             | 770               | 19                                   | NR                             | 900               | 1                                    | NR                             |
| 385               | 0                                    | NR                             | 515               | 403                                  | NR                             | 645               | 689                                  | NR                             | 775               | 16                                   | NR                             | 905               | 1                                    | NR                             |
| 390               | 0                                    | NR                             | 520               | 435                                  | NR                             | 650               | 626                                  | NR                             | 780               | 14                                   | NR                             | 910               | 0                                    | NR                             |
| 395               | 1                                    | NR                             | 525               | 459                                  | NR                             | 655               | 564                                  | NR                             | 785               | 12                                   | NR                             | 915               | 0                                    | NR                             |
| 400               | 3                                    | NR                             | 530               | 481                                  | NR                             | 660               | 503                                  | NR                             | 790               | 10                                   | NR                             | 920               | 0                                    | NR                             |
| 405               | 6                                    | NR                             | 535               | 501                                  | NR                             | 665               | 447                                  | NR                             | 795               | 9                                    | NR                             | 925               | 0                                    | NR                             |
| 410               | 13                                   | NR                             | 540               | 519                                  | NR                             | 670               | 392                                  | NR                             | 800               | 8                                    | NR                             | 930               | 0                                    | NR                             |
| 415               | 26                                   | NR                             | 545               | 542                                  | NR                             | 675               | 343                                  | NR                             | 805               | 7                                    | NR                             | 935               | 0                                    | NR                             |
| 420               | 51                                   | NR                             | 550               | 565                                  | NR                             | 680               | 299                                  | NR                             | 810               | 6                                    | NR                             | 940               | 0                                    | NR                             |
| 425               | 93                                   | NR                             | 555               | 593                                  | NR                             | 685               | 260                                  | NR                             | 815               | 5                                    | NR                             | 945               | 0                                    | NR                             |
| 430               | 156                                  | NR                             | 560               | 624                                  | NR                             | 690               | 225                                  | NR                             | 820               | 4                                    | NR                             | 950               | 0                                    | NR                             |
| 435               | 250                                  | NR                             | 565               | 662                                  | NR                             | 695               | 194                                  | NR                             | 825               | 4                                    | NR                             | 955               | 0                                    | NR                             |
| 440               | 391                                  | NR                             | 570               | 707                                  | NR                             | 700               | 166                                  | NR                             | 830               | 3                                    | NR                             | 960               | 0                                    | NR                             |
| 445               | 460                                  | NR                             | 575               | 756                                  | NR                             | 705               | 143                                  | NR                             | 835               | 3                                    | NR                             | 965               | 0                                    | NR                             |
| 450               | 293                                  | NR                             | 580               | 810                                  | NR                             | 710               | 122                                  | NR                             | 840               | 2                                    | NR                             | 970               | 0                                    | NR                             |
| 455               | 188                                  | NR                             | 585               | 860                                  | NR                             | 715               | 105                                  | NR                             | 845               | 2                                    | NR                             | 975               | 0                                    | NR                             |
| 460               | 149                                  | NR                             | 590               | 910                                  | NR                             | 720               | 90                                   | NR                             | 850               | 2                                    | NR                             | 980               | 0                                    | NR                             |
| 465               | 103                                  | NR                             | 595               | 950                                  | NR                             | 725               | 77                                   | NR                             | 855               | 2                                    | NR                             | 985               | 0                                    | NR                             |
| 470               | 80                                   | NR                             | 600               | 980                                  | NR                             | 730               | 66                                   | NR                             | 860               | 1                                    | NR                             | 990               | 0                                    | NR                             |
| 475               | 82                                   | NR                             | 605               | 995                                  | NR                             | 735               | 56                                   | NR                             | 865               | 1                                    | NR                             | 995               | 0                                    | NR                             |
| 480               | 92                                   | NR                             | 610               | 998                                  | NR                             | 740               | 48                                   | NR                             | 870               | 1                                    | NR                             | 1000              | 0                                    | NR                             |
| 485               | 116                                  | NR                             | 615               | 985                                  | NR                             | 745               | 41                                   | NR                             | 875               | 1                                    | NR                             |                   |                                      |                                |

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TM-30-18

### Summary

$R_f = 82.2$   
 $R_g = 99.9$   
 $CIE R_a = 82.9$   
 $R_9 = 10.8$



### Color Vector Graphics



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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 76 | CES51 = 89 | CES76 = 75 |
| CES02 = 63 | CES27 = 89 | CES52 = 91 | CES77 = 87 |
| CES03 = 31 | CES28 = 90 | CES53 = 82 | CES78 = 76 |
| CES04 = 71 | CES29 = 68 | CES54 = 88 | CES79 = 91 |
| CES05 = 50 | CES30 = 69 | CES55 = 87 | CES80 = 90 |
| CES06 = 52 | CES31 = 72 | CES56 = 80 | CES81 = 74 |
| CES07 = 43 | CES32 = 71 | CES57 = 78 | CES82 = 95 |
| CES08 = 42 | CES33 = 71 | CES58 = 80 | CES83 = 90 |
| CES09 = 29 | CES34 = 84 | CES59 = 93 | CES84 = 94 |
| CES10 = 77 | CES35 = 92 | CES60 = 96 | CES85 = 83 |
| CES11 = 59 | CES36 = 92 | CES61 = 94 | CES86 = 69 |
| CES12 = 66 | CES37 = 89 | CES62 = 84 | CES87 = 85 |
| CES13 = 44 | CES38 = 75 | CES63 = 79 | CES88 = 84 |
| CES14 = 74 | CES39 = 93 | CES64 = 85 | CES89 = 74 |
| CES15 = 72 | CES40 = 89 | CES65 = 79 | CES90 = 81 |
| CES16 = 48 | CES41 = 85 | CES66 = 83 | CES91 = 96 |
| CES17 = 50 | CES42 = 88 | CES67 = 82 | CES92 = 72 |
| CES18 = 57 | CES43 = 81 | CES68 = 86 | CES93 = 84 |
| CES19 = 73 | CES44 = 98 | CES69 = 92 | CES94 = 63 |
| CES20 = 67 | CES45 = 87 | CES70 = 81 | CES95 = 80 |
| CES21 = 87 | CES46 = 82 | CES71 = 81 | CES96 = 85 |
| CES22 = 79 | CES47 = 76 | CES72 = 93 | CES97 = 87 |
| CES23 = 92 | CES48 = 71 | CES73 = 75 | CES98 = 82 |
| CES24 = 91 | CES49 = 81 | CES74 = 91 | CES99 = 76 |
| CES25 = 72 | CES50 = 88 | CES75 = 79 |            |



Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)