

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: P1067496

Luminaire Tested: **NAV-SA3D-735-U-T4BC**

Issue Date: 08/07/2025

**Test Information**

Test Method: LM-79-08  
Report Number: P1067496  
Test Lab: INNOVATION CENTER(G3)  
Issue Date: 08/07/2025  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: LUMARK  
Catalog Number: NAV-SA3D-735-U-T4BC  
Description: Navion AREA AND ROADWAY LUMINAIRE 1200mA 3xLight Square PACKAGE  
70CRI 3500K FIXTURE w/ TYPE IV ANGLED BACKLIGHT CONTROL  
Light Source: (42) 3500K CCT, 70 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 16960.5 lumens  
Efficiency: N/A  
Efficacy: 105.4 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 1.5' x H: 0')  
IES Classification: Type IV - Short  
BUG Rating: B0 - U0 - G4

Input Watts (W): 160.9  
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

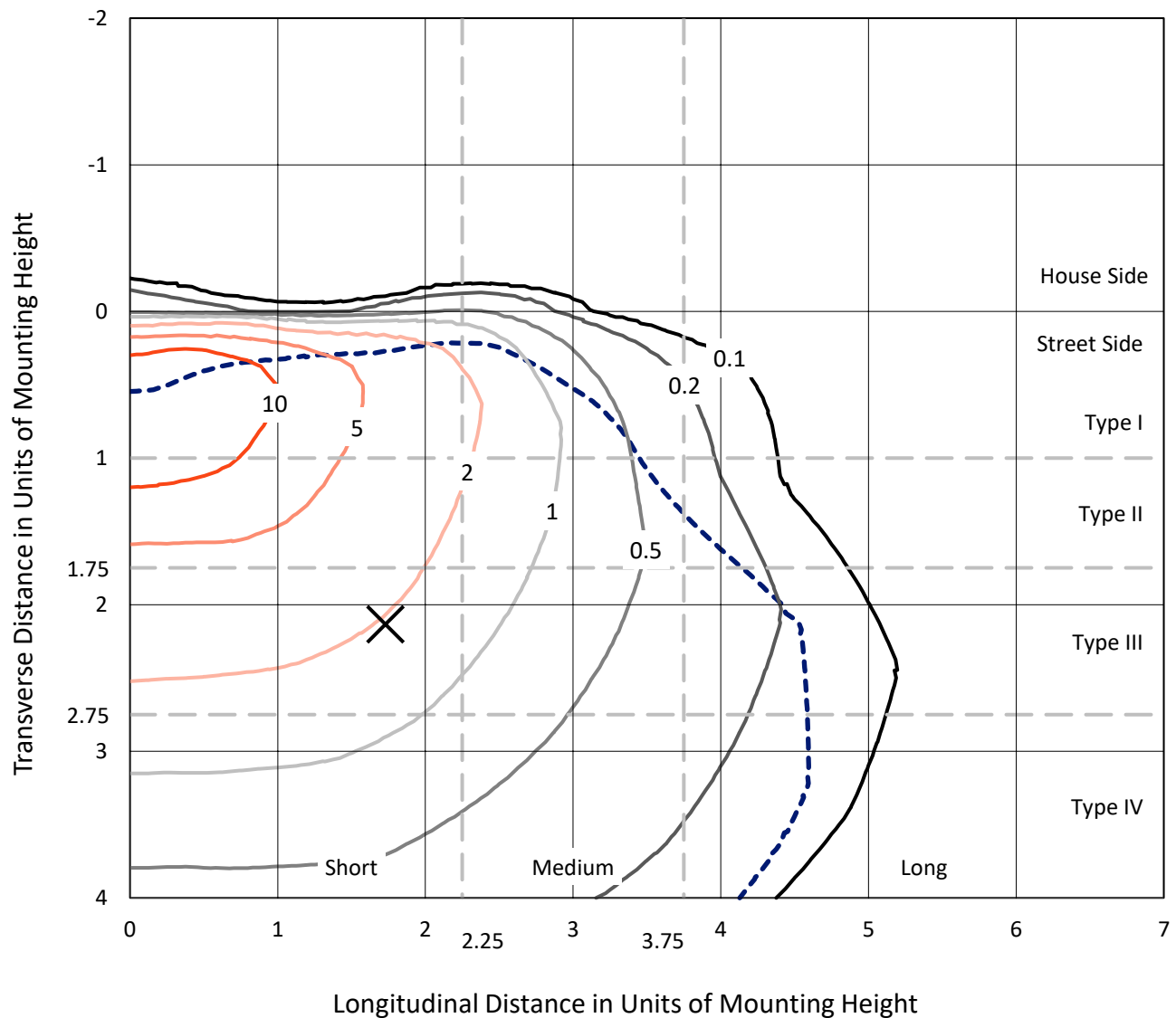


REPORT NUMBER: P1067496

CATALOG NUMBER: NAV-SA3D-735-U-T4BC

## Iso-Footcandle Lines of Horizontal Illumination

× Max cd  
 - - - 1/2 Max cd

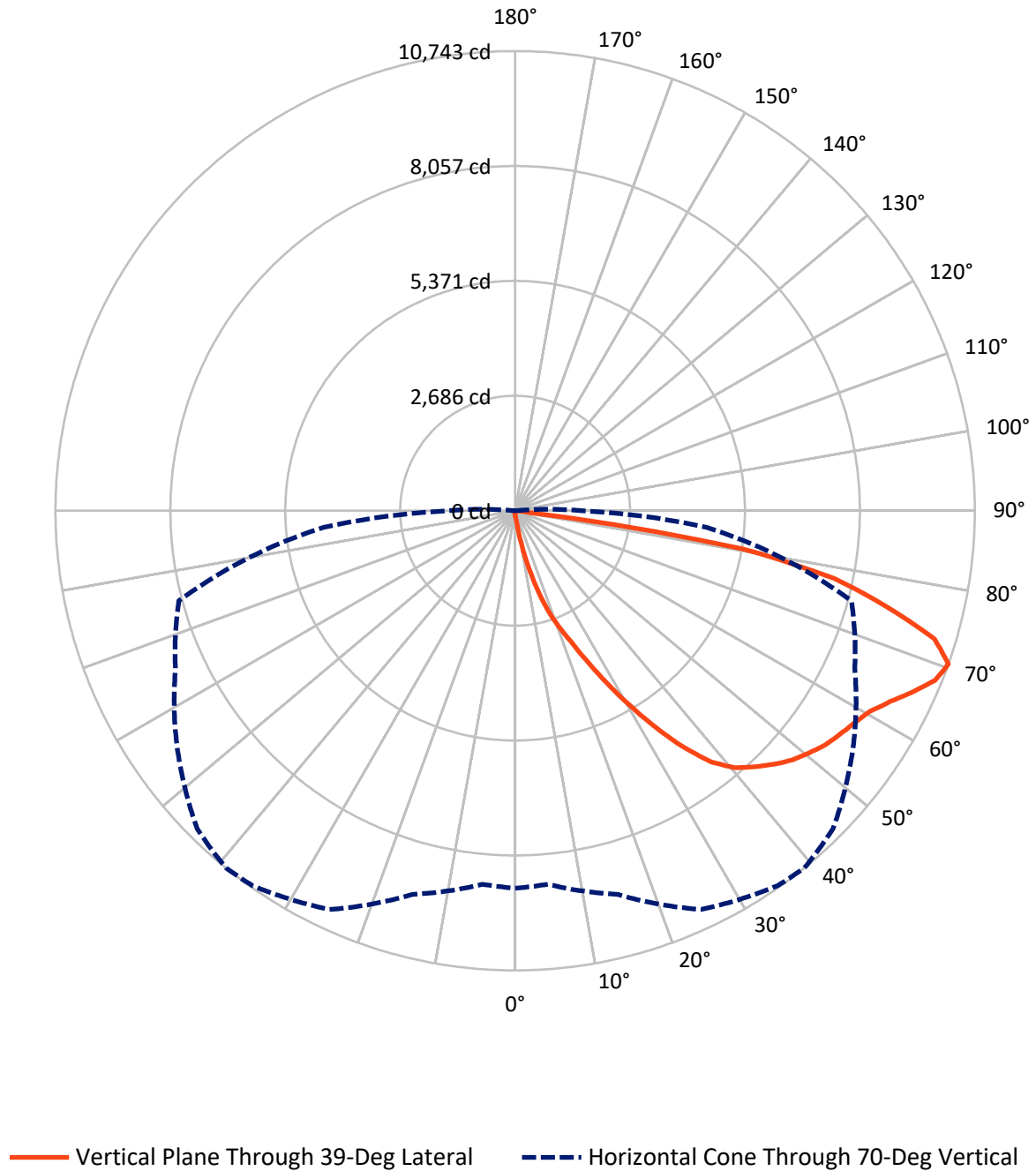


Based on 15 foot mounting height. Maximum calculated value = 18.5 fc  
 Type IV - Short - N/A

REPORT NUMBER: P1067496

CATALOG NUMBER: NAV-SA3D-735-U-T4BC

## Luminous Intensity Polar Plot



REPORT NUMBER: P1067496

CATALOG NUMBER: NAV-SA3D-735-U-T4BC

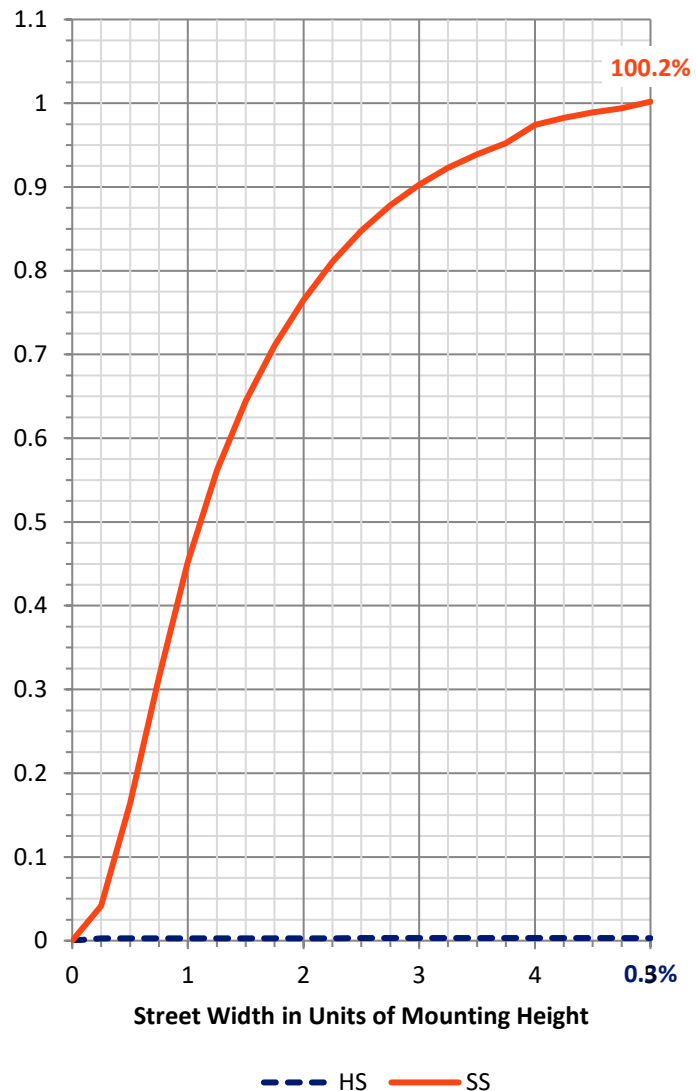
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 52.2     | 0.0    | 52.2    |
|                    | % Fixture | 0.3      | 0.0    | 0.3     |
| <b>Street Side</b> | Lumens    | 16908.3  | 0.0    | 16908.3 |
|                    | % Fixture | 99.7     | 0.0    | 99.7    |
| <b>Total</b>       | Lumens    | 16960.5  | 0.0    | 16960.5 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**Coefficient of Utilization**

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 17.8    | 0.1       |
| 10°-20°   | 208.5   | 1.2       |
| 20°-30°   | 707.6   | 4.2       |
| 30°-40°   | 1662.9  | 9.8       |
| 40°-50°   | 2700.2  | 15.9      |
| 50°-60°   | 3421.7  | 20.2      |
| 60°-70°   | 4346.5  | 25.6      |
| 70°-80°   | 3531.5  | 20.8      |
| 80°-90°   | 363.6   | 2.1       |
| 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°    | 16960.5 | 100.0     |
| 0°-180°   | 16960.5 | 100.0     |



REPORT NUMBER: P1067496

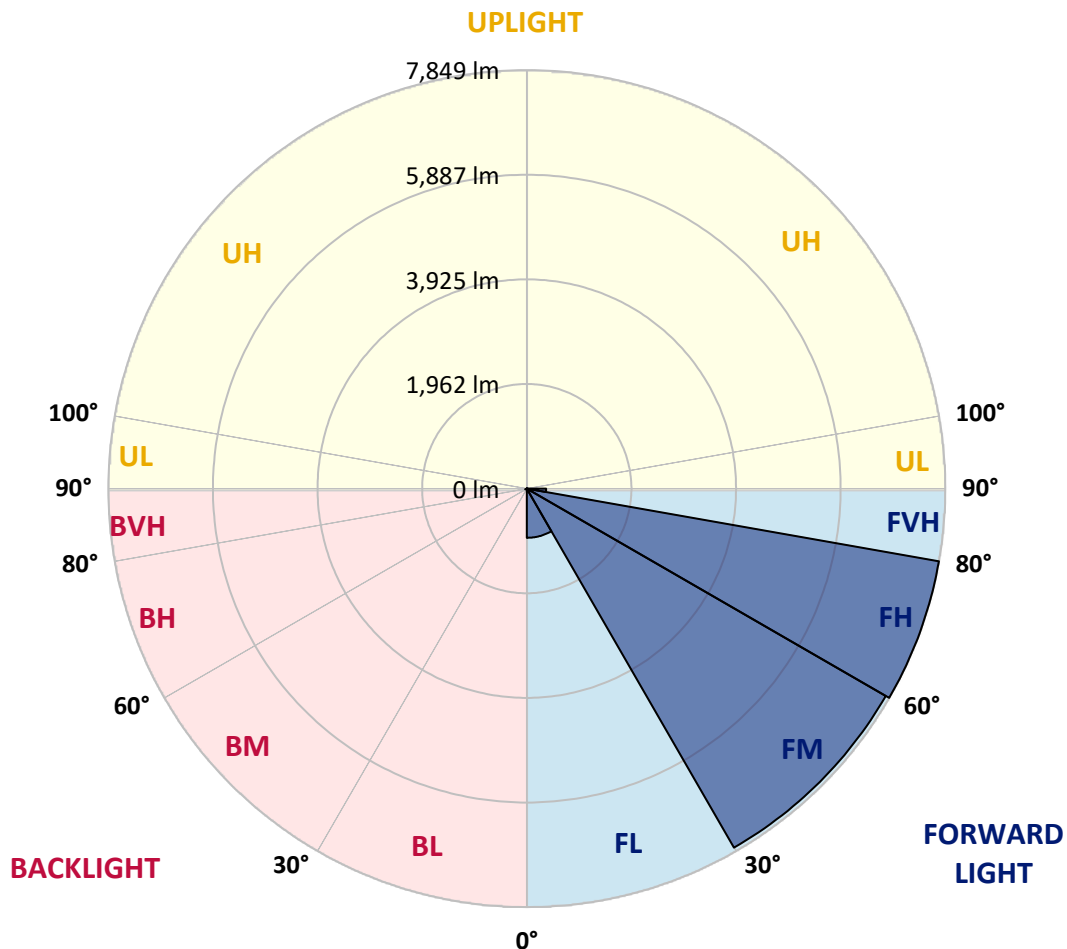
CATALOG NUMBER: NAV-SA3D-735-U-T4BC

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |          |
|------|-------------|--------|-----------|-------------------------|------|----------|
|      |             |        |           | B                       | U    | G        |
| FL   | (0°-30°)    | 922.6  | 5.4       |                         |      |          |
| FM   | (30°-60°)   | 7774.9 | 45.8      |                         |      |          |
| FH   | (60°-80°)   | 7849.3 | 46.3      |                         |      | G4/12000 |
| FVH  | (80°-90°)   | 361.5  | 2.1       |                         |      | G3/500   |
| BL   | (0°-30°)    | 11.3   | 0.1       | B0/110                  |      |          |
| BM   | (30°-60°)   | 10.0   | 0.1       | B0/220                  |      |          |
| BH   | (60°-80°)   | 28.7   | 0.2       | B0/110                  |      | G0/110   |
| BVH  | (80°-90°)   | 2.2    | 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-G4**

Type IV Short



REPORT NUMBER: P1067496

CATALOG NUMBER: NAV-SA3D-735-U-T4BC

**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°     | 35°     | 39°     | 45°     | 55°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|---------|---------|---------|---------|--------|--------|--------|--------|
| 0°    | 92.1   | 92.1   | 92.1   | 92.1    | 92.1    | 92.1    | 92.1    | 92.1   | 92.1   | 92.1   | 92.1   |
| 2.5°  | 119.7  | 119.7  | 119.7  | 115.1   | 115.1   | 110.5   | 110.5   | 105.9  | 101.3  | 101.3  | 96.7   |
| 5°    | 225.6  | 230.2  | 216.4  | 188.8   | 170.4   | 161.2   | 152.0   | 128.9  | 115.1  | 105.9  | 96.7   |
| 7.5°  | 617.0  | 598.6  | 571.0  | 478.9   | 368.4   | 313.1   | 267.1   | 188.8  | 138.1  | 110.5  | 96.7   |
| 10°   | 1298.5 | 1247.9 | 1169.6 | 1045.3  | 828.9   | 741.4   | 575.6   | 345.4  | 193.4  | 124.3  | 96.7   |
| 12.5° | 1906.4 | 1915.6 | 1818.9 | 1699.1  | 1436.7  | 1289.3  | 1063.7  | 649.3  | 303.9  | 147.4  | 96.7   |
| 15°   | 2366.8 | 2357.6 | 2320.8 | 2224.1  | 1989.2  | 1846.5  | 1643.9  | 1091.3 | 511.1  | 184.2  | 101.3  |
| 17.5° | 2730.6 | 2693.8 | 2679.9 | 2638.5  | 2486.6  | 2408.3  | 2187.2  | 1607.0 | 810.4  | 248.7  | 105.9  |
| 20°   | 3094.4 | 3085.2 | 3071.4 | 3025.3  | 2924.0  | 2868.7  | 2698.4  | 2127.4 | 1206.4 | 354.6  | 115.1  |
| 22.5° | 3623.9 | 3573.3 | 3582.5 | 3481.2  | 3398.3  | 3301.6  | 3163.4  | 2679.9 | 1662.3 | 506.5  | 128.9  |
| 25°   | 4245.6 | 4241.0 | 4167.3 | 4121.2  | 3983.1  | 3877.2  | 3693.0  | 3214.1 | 2168.8 | 732.2  | 142.7  |
| 27.5° | 4977.7 | 4927.1 | 4894.8 | 4816.5  | 4673.8  | 4554.1  | 4300.8  | 3743.6 | 2716.8 | 985.4  | 161.2  |
| 30°   | 5742.1 | 5742.1 | 5682.2 | 5562.5  | 5424.4  | 5277.0  | 5019.1  | 4300.8 | 3260.1 | 1307.7 | 184.2  |
| 32.5° | 6635.4 | 6653.8 | 6506.5 | 6326.9  | 6147.3  | 6046.0  | 5709.9  | 4931.7 | 3780.5 | 1676.1 | 211.8  |
| 35°   | 7501.1 | 7478.1 | 7234.0 | 7036.0  | 6902.5  | 6792.0  | 6506.5  | 5622.4 | 4369.9 | 2104.4 | 248.7  |
| 37.5° | 8329.9 | 8270.1 | 7864.9 | 7584.0  | 7524.1  | 7450.4  | 7165.0  | 6313.1 | 4954.7 | 2578.6 | 294.7  |
| 40°   | 8924.0 | 8831.9 | 8412.8 | 8026.0  | 7938.5  | 7897.1  | 7676.1  | 6939.3 | 5571.7 | 3108.2 | 354.6  |
| 42.5° | 9181.8 | 9075.9 | 8785.8 | 8472.7  | 8279.3  | 8182.6  | 7989.2  | 7450.4 | 6188.7 | 3697.6 | 442.1  |
| 45°   | 9232.5 | 9149.6 | 8942.4 | 8868.7  | 8606.2  | 8458.9  | 8196.4  | 7814.2 | 6764.3 | 4282.4 | 561.8  |
| 47.5° | 9048.3 | 9011.4 | 8887.1 | 9043.7  | 8910.1  | 8707.5  | 8389.8  | 8085.9 | 7275.5 | 4991.5 | 727.5  |
| 50°   | 8597.0 | 8569.4 | 8629.3 | 9039.1  | 9131.2  | 8900.9  | 8601.6  | 8297.7 | 7717.5 | 5723.7 | 962.4  |
| 52.5° | 7989.2 | 7984.6 | 8265.5 | 8919.4  | 9227.9  | 9085.1  | 8808.8  | 8509.5 | 8067.5 | 6432.8 | 1293.9 |
| 55°   | 7326.1 | 7404.4 | 7897.1 | 8808.8  | 9283.1  | 9218.7  | 9011.4  | 8698.3 | 8380.6 | 7091.3 | 1828.1 |
| 57.5° | 7270.9 | 7238.6 | 7712.9 | 8762.8  | 9315.4  | 9352.2  | 9214.1  | 8896.3 | 8647.7 | 7630.0 | 2541.8 |
| 60°   | 7823.4 | 7749.8 | 7929.3 | 8859.5  | 9458.1  | 9522.6  | 9416.7  | 9048.3 | 8914.7 | 8053.7 | 3481.2 |
| 62.5° | 8463.5 | 8394.4 | 8486.5 | 9232.5  | 9739.0  | 9831.1  | 9697.6  | 9204.8 | 9131.2 | 8348.4 | 4489.6 |
| 65°   | 8974.6 | 8919.4 | 9094.3 | 9789.6  | 10130.4 | 10208.7 | 10116.6 | 9494.9 | 9227.9 | 8587.8 | 5309.2 |
| 67.5° | 9057.5 | 8988.4 | 9352.2 | 10162.6 | 10526.4 | 10581.7 | 10508.0 | 9775.8 | 9195.6 | 8606.2 | 5498.0 |
| 70°   | 8822.7 | 8762.8 | 9283.1 | 10282.4 | 10696.8 | 10742.8 | 10508.0 | 9642.3 | 8758.2 | 8136.5 | 4494.2 |
| 72.5° | 8099.7 | 8145.8 | 8818.0 | 9992.3  | 10461.9 | 10250.1 | 9752.8  | 8970.0 | 8191.8 | 6897.9 | 3154.2 |
| 75°   | 6976.2 | 7026.8 | 7920.1 | 9195.6  | 9232.5  | 8974.6  | 8707.5  | 8251.7 | 7330.7 | 4544.9 | 2187.2 |
| 77.5° | 4959.3 | 4779.7 | 6115.1 | 7593.2  | 7459.7  | 7625.4  | 7648.4  | 6865.6 | 6138.1 | 2366.8 | 1464.3 |
| 80°   | 488.1  | 414.4  | 769.0  | 2178.0  | 4811.9  | 5378.3  | 5599.3  | 5290.8 | 4526.4 | 1059.1 | 769.0  |
| 82.5° | 105.9  | 105.9  | 115.1  | 124.3   | 193.4   | 290.1   | 1330.8  | 3260.1 | 2924.0 | 538.8  | 248.7  |
| 85°   | 59.9   | 59.9   | 73.7   | 87.5    | 115.1   | 128.9   | 152.0   | 202.6  | 787.4  | 193.4  | 46.0   |
| 87.5° | 46.0   | 50.7   | 59.9   | 73.7    | 96.7    | 105.9   | 128.9   | 161.2  | 198.0  | 179.6  | 13.8   |
| 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: P1067496

CATALOG NUMBER: NAV-SA3D-735-U-T4BC

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°  | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|-------|--------|------|------|------|------|------|------|------|------|------|------|
| 0°    | 92.1   | 92.1 | 92.1 | 92.1 | 92.1 | 92.1 | 92.1 | 92.1 | 92.1 | 92.1 | 92.1 |
| 2.5°  | 96.7   | 92.1 | 87.5 | 82.9 | 78.3 | 78.3 | 73.7 | 73.7 | 73.7 | 73.7 | 73.7 |
| 5°    | 92.1   | 87.5 | 82.9 | 73.7 | 69.1 | 64.5 | 59.9 | 59.9 | 59.9 | 59.9 | 59.9 |
| 7.5°  | 92.1   | 87.5 | 78.3 | 69.1 | 59.9 | 55.3 | 50.7 | 46.0 | 46.0 | 50.7 | 50.7 |
| 10°   | 92.1   | 82.9 | 69.1 | 59.9 | 50.7 | 46.0 | 41.4 | 36.8 | 36.8 | 36.8 | 36.8 |
| 12.5° | 87.5   | 78.3 | 64.5 | 55.3 | 46.0 | 36.8 | 27.6 | 23.0 | 23.0 | 23.0 | 23.0 |
| 15°   | 82.9   | 73.7 | 59.9 | 46.0 | 32.2 | 23.0 | 18.4 | 13.8 | 13.8 | 13.8 | 13.8 |
| 17.5° | 82.9   | 69.1 | 55.3 | 41.4 | 23.0 | 13.8 | 9.2  | 4.6  | 4.6  | 4.6  | 9.2  |
| 20°   | 82.9   | 69.1 | 50.7 | 32.2 | 13.8 | 9.2  | 9.2  | 4.6  | 0.0  | 4.6  | 4.6  |
| 22.5° | 82.9   | 64.5 | 41.4 | 23.0 | 13.8 | 9.2  | 4.6  | 0.0  | 0.0  | 0.0  | 0.0  |
| 25°   | 87.5   | 64.5 | 36.8 | 18.4 | 9.2  | 4.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 27.5° | 87.5   | 59.9 | 32.2 | 13.8 | 4.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 30°   | 92.1   | 59.9 | 27.6 | 9.2  | 4.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 32.5° | 92.1   | 55.3 | 18.4 | 9.2  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 35°   | 92.1   | 50.7 | 13.8 | 4.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 37.5° | 92.1   | 46.0 | 13.8 | 4.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 40°   | 96.7   | 41.4 | 9.2  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 42.5° | 101.3  | 36.8 | 9.2  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 45°   | 105.9  | 32.2 | 4.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 47.5° | 119.7  | 32.2 | 4.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 50°   | 138.1  | 32.2 | 4.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 52.5° | 165.8  | 32.2 | 4.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 55°   | 216.4  | 27.6 | 4.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 57.5° | 313.1  | 27.6 | 4.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 60°   | 524.9  | 27.6 | 4.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 62.5° | 920.9  | 27.6 | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 65°   | 1556.4 | 27.6 | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 67.5° | 2030.7 | 32.2 | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 70°   | 1542.6 | 27.6 | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 72.5° | 736.8  | 18.4 | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 75°   | 326.9  | 18.4 | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 77.5° | 142.7  | 13.8 | 4.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 80°   | 55.3   | 9.2  | 4.6  | 4.6  | 4.6  | 4.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 82.5° | 23.0   | 9.2  | 4.6  | 4.6  | 4.6  | 4.6  | 4.6  | 0.0  | 0.0  | 0.0  | 0.0  |
| 85°   | 13.8   | 9.2  | 9.2  | 9.2  | 4.6  | 4.6  | 4.6  | 0.0  | 0.0  | 0.0  | 0.0  |
| 87.5° | 9.2    | 9.2  | 9.2  | 9.2  | 9.2  | 4.6  | 4.6  | 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: SP1-2407-184-5

Test Date: 10/10/2024

Luminaire Tested: GSS-SB1A-735-U-5WQ

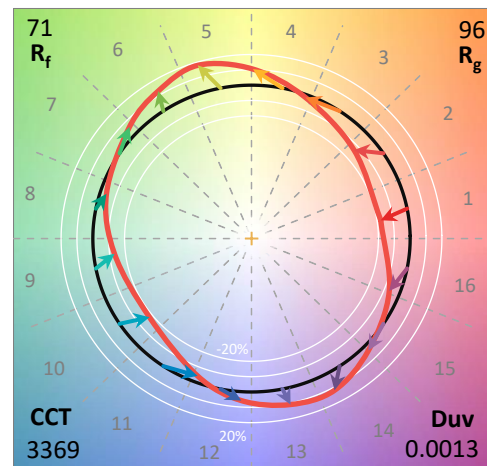
Data in this report applies to families of products including GSS-SB1A-735-U-5WQ

### Test Information

Test Method: LM-79-2019  
 Report Number: SP1-2407-184-5  
 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-735-U-5WQ**  
 Description: GALLEON II SITE SLIM 1SQ 350MA 5WQ HIGH DENSITY LIGHTSQUARE WITH 70 CRI 3500K CCT 26 LEDS

### Spectral Parameters

|                           |          |           |      |      |       |
|---------------------------|----------|-----------|------|------|-------|
| CCT (K):                  | 3369     | CRI (Ra): | 70.1 |      |       |
| CIE u':                   | 0.2386   | R1:       | 66.6 | R9:  | -40.2 |
| CIE v':                   | 0.5156   | R2:       | 77.6 | R10: | 49.1  |
| Duv:                      | 0.0013   | R3:       | 88.5 | R11: | 66.3  |
| CIE x:                    | 0.4143   | R4:       | 69.5 | R12: | 45.7  |
| CIE y:                    | 0.3980   | R5:       | 66.4 | R13: | 68.0  |
| CIE z:                    | 0.1877   | R6:       | 69.6 | R14: | 93.4  |
| Peak Wavelength (nm):     | 590      | R7:       | 77.5 | R15: | 57.6  |
| Dominant Wavelength (nm): | 580      | R8:       | 44.9 |      |       |
| Purity:                   | 43.80166 |           |      |      |       |
| Rf:                       | 71.4     |           |      |      |       |
| Rg:                       | 96       |           |      |      |       |



### Test Conditions

Stabilization Time: 21M  
 Operation Time: 1H 21M  
 Sphere Temperature (°C): 25.2

REPORT NUMBER: SP1-2407-184-5

| 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: SP1-2407-184-5

### Photopic Flux vs. Wavelength



### Photopic Lumens: NR

| λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(φ/nm) |
|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|
| 360       | 0                           | NR               | 490       | 119                         | NR               | 620       | 778                         | NR               | 750       | 19                          | NR               | 880       | 1                           | NR               |
| 365       | 0                           | NR               | 495       | 173                         | NR               | 625       | 711                         | NR               | 755       | 16                          | NR               | 885       | 0                           | NR               |
| 370       | 0                           | NR               | 500       | 239                         | NR               | 630       | 648                         | NR               | 760       | 14                          | NR               | 890       | 0                           | NR               |
| 375       | 0                           | NR               | 505       | 313                         | NR               | 635       | 582                         | NR               | 765       | 12                          | NR               | 895       | 0                           | NR               |
| 380       | 0                           | NR               | 510       | 383                         | NR               | 640       | 520                         | NR               | 770       | 11                          | NR               | 900       | 0                           | NR               |
| 385       | 0                           | NR               | 515       | 448                         | NR               | 645       | 460                         | NR               | 775       | 9                           | NR               | 905       | 0                           | NR               |
| 390       | 2                           | NR               | 520       | 500                         | NR               | 650       | 406                         | NR               | 780       | 8                           | NR               | 910       | 0                           | NR               |
| 395       | 4                           | NR               | 525       | 539                         | NR               | 655       | 355                         | NR               | 785       | 7                           | NR               | 915       | 0                           | NR               |
| 400       | 6                           | NR               | 530       | 575                         | NR               | 660       | 309                         | NR               | 790       | 6                           | NR               | 920       | 0                           | NR               |
| 405       | 11                          | NR               | 535       | 606                         | NR               | 665       | 269                         | NR               | 795       | 5                           | NR               | 925       | 0                           | NR               |
| 410       | 22                          | NR               | 540       | 633                         | NR               | 670       | 231                         | NR               | 800       | 4                           | NR               | 930       | 0                           | NR               |
| 415       | 45                          | NR               | 545       | 666                         | NR               | 675       | 199                         | NR               | 805       | 4                           | NR               | 935       | 0                           | NR               |
| 420       | 96                          | NR               | 550       | 701                         | NR               | 680       | 171                         | NR               | 810       | 3                           | NR               | 940       | 0                           | NR               |
| 425       | 193                         | NR               | 555       | 743                         | NR               | 685       | 147                         | NR               | 815       | 3                           | NR               | 945       | 0                           | NR               |
| 430       | 341                         | NR               | 560       | 788                         | NR               | 690       | 126                         | NR               | 820       | 3                           | NR               | 950       | 0                           | NR               |
| 435       | 547                         | NR               | 565       | 837                         | NR               | 695       | 107                         | NR               | 825       | 2                           | NR               | 955       | 0                           | NR               |
| 440       | 799                         | NR               | 570       | 887                         | NR               | 700       | 92                          | NR               | 830       | 2                           | NR               | 960       | 0                           | NR               |
| 445       | 831                         | NR               | 575       | 931                         | NR               | 705       | 78                          | NR               | 835       | 2                           | NR               | 965       | 0                           | NR               |
| 450       | 461                         | NR               | 580       | 967                         | NR               | 710       | 67                          | NR               | 840       | 2                           | NR               | 970       | 0                           | NR               |
| 455       | 256                         | NR               | 585       | 990                         | NR               | 715       | 57                          | NR               | 845       | 1                           | NR               | 975       | 0                           | NR               |
| 460       | 176                         | NR               | 590       | 1000                        | NR               | 720       | 49                          | NR               | 850       | 1                           | NR               | 980       | 0                           | NR               |
| 465       | 107                         | NR               | 595       | 994                         | NR               | 725       | 42                          | NR               | 855       | 1                           | NR               | 985       | 0                           | NR               |
| 470       | 74                          | NR               | 600       | 973                         | NR               | 730       | 36                          | NR               | 860       | 1                           | NR               | 990       | 0                           | NR               |
| 475       | 67                          | NR               | 605       | 938                         | NR               | 735       | 31                          | NR               | 865       | 1                           | NR               | 995       | 0                           | NR               |
| 480       | 68                          | NR               | 610       | 892                         | NR               | 740       | 26                          | NR               | 870       | 1                           | NR               | 1000      | 0                           | NR               |
| 485       | 84                          | NR               | 615       | 838                         | NR               | 745       | 22                          | NR               | 875       | 1                           | NR               |           |                             |                  |

REPORT NUMBER: SP1-2407-184-5

### Scotopic Flux vs. Wavelength



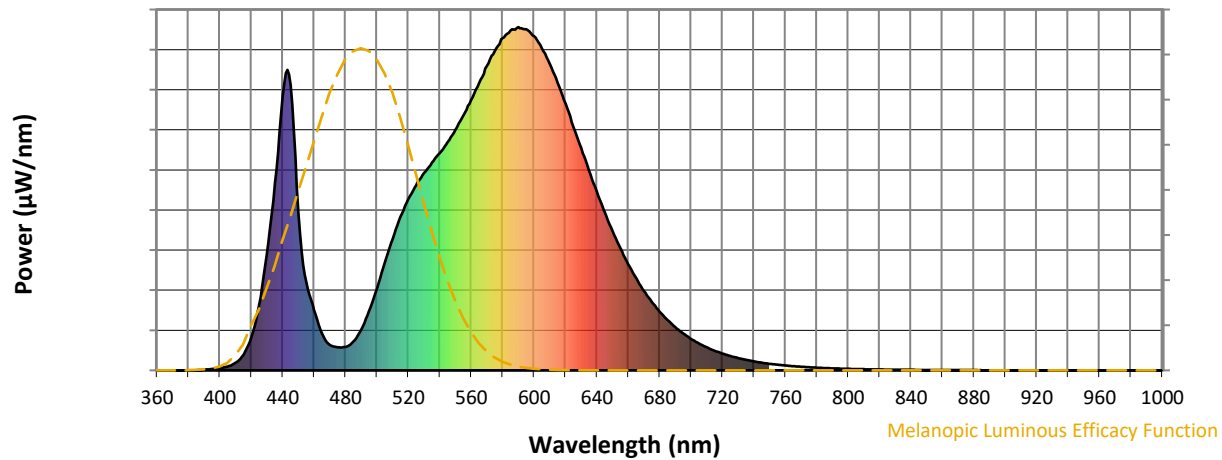
Scotopic Lumens: NR

S/P: 1.29

| λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(Φ/nm) |
|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|
| 360       | 0                           | NR               | 490       | 119                         | NR               | 620       | 778                         | NR               | 750       | 19                          | NR               | 880       | 1                           | NR               |
| 365       | 0                           | NR               | 495       | 173                         | NR               | 625       | 711                         | NR               | 755       | 16                          | NR               | 885       | 0                           | NR               |
| 370       | 0                           | NR               | 500       | 239                         | NR               | 630       | 648                         | NR               | 760       | 14                          | NR               | 890       | 0                           | NR               |
| 375       | 0                           | NR               | 505       | 313                         | NR               | 635       | 582                         | NR               | 765       | 12                          | NR               | 895       | 0                           | NR               |
| 380       | 0                           | NR               | 510       | 383                         | NR               | 640       | 520                         | NR               | 770       | 11                          | NR               | 900       | 0                           | NR               |
| 385       | 0                           | NR               | 515       | 448                         | NR               | 645       | 460                         | NR               | 775       | 9                           | NR               | 905       | 0                           | NR               |
| 390       | 2                           | NR               | 520       | 500                         | NR               | 650       | 406                         | NR               | 780       | 8                           | NR               | 910       | 0                           | NR               |
| 395       | 4                           | NR               | 525       | 539                         | NR               | 655       | 355                         | NR               | 785       | 7                           | NR               | 915       | 0                           | NR               |
| 400       | 6                           | NR               | 530       | 575                         | NR               | 660       | 309                         | NR               | 790       | 6                           | NR               | 920       | 0                           | NR               |
| 405       | 11                          | NR               | 535       | 606                         | NR               | 665       | 269                         | NR               | 795       | 5                           | NR               | 925       | 0                           | NR               |
| 410       | 22                          | NR               | 540       | 633                         | NR               | 670       | 231                         | NR               | 800       | 4                           | NR               | 930       | 0                           | NR               |
| 415       | 45                          | NR               | 545       | 666                         | NR               | 675       | 199                         | NR               | 805       | 4                           | NR               | 935       | 0                           | NR               |
| 420       | 96                          | NR               | 550       | 701                         | NR               | 680       | 171                         | NR               | 810       | 3                           | NR               | 940       | 0                           | NR               |
| 425       | 193                         | NR               | 555       | 743                         | NR               | 685       | 147                         | NR               | 815       | 3                           | NR               | 945       | 0                           | NR               |
| 430       | 341                         | NR               | 560       | 788                         | NR               | 690       | 126                         | NR               | 820       | 3                           | NR               | 950       | 0                           | NR               |
| 435       | 547                         | NR               | 565       | 837                         | NR               | 695       | 107                         | NR               | 825       | 2                           | NR               | 955       | 0                           | NR               |
| 440       | 799                         | NR               | 570       | 887                         | NR               | 700       | 92                          | NR               | 830       | 2                           | NR               | 960       | 0                           | NR               |
| 445       | 831                         | NR               | 575       | 931                         | NR               | 705       | 78                          | NR               | 835       | 2                           | NR               | 965       | 0                           | NR               |
| 450       | 461                         | NR               | 580       | 967                         | NR               | 710       | 67                          | NR               | 840       | 2                           | NR               | 970       | 0                           | NR               |
| 455       | 256                         | NR               | 585       | 990                         | NR               | 715       | 57                          | NR               | 845       | 1                           | NR               | 975       | 0                           | NR               |
| 460       | 176                         | NR               | 590       | 1000                        | NR               | 720       | 49                          | NR               | 850       | 1                           | NR               | 980       | 0                           | NR               |
| 465       | 107                         | NR               | 595       | 994                         | NR               | 725       | 42                          | NR               | 855       | 1                           | NR               | 985       | 0                           | NR               |
| 470       | 74                          | NR               | 600       | 973                         | NR               | 730       | 36                          | NR               | 860       | 1                           | NR               | 990       | 0                           | NR               |
| 475       | 67                          | NR               | 605       | 938                         | NR               | 735       | 31                          | NR               | 865       | 1                           | NR               | 995       | 0                           | NR               |
| 480       | 68                          | NR               | 610       | 892                         | NR               | 740       | 26                          | NR               | 870       | 1                           | NR               | 1000      | 0                           | NR               |
| 485       | 84                          | NR               | 615       | 838                         | NR               | 745       | 22                          | NR               | 875       | 1                           | NR               |           |                             |                  |

REPORT NUMBER: SP1-2407-184-5

### Melanopic Flux vs. Wavelength



Melanopic Lumens: NR

M/P: 2.36

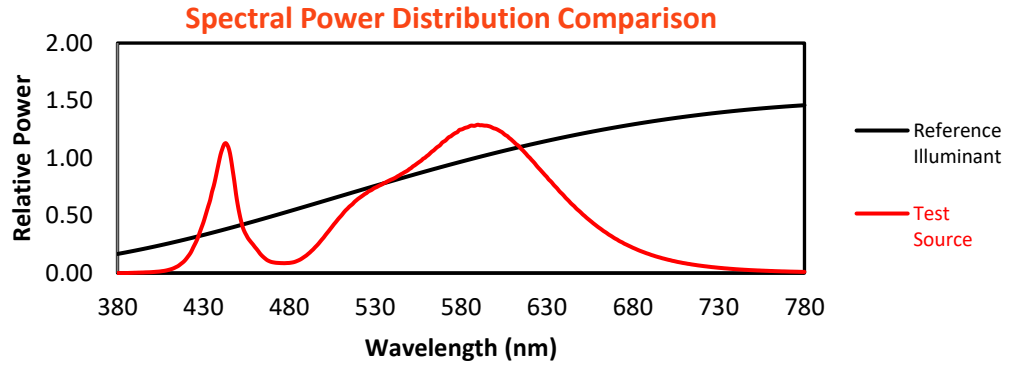
| λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(φ/nm) |
|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|
| 360       | 0                           | NR               | 490       | 119                         | NR               | 620       | 778                         | NR               | 750       | 19                          | NR               | 880       | 1                           | NR               |
| 365       | 0                           | NR               | 495       | 173                         | NR               | 625       | 711                         | NR               | 755       | 16                          | NR               | 885       | 0                           | NR               |
| 370       | 0                           | NR               | 500       | 239                         | NR               | 630       | 648                         | NR               | 760       | 14                          | NR               | 890       | 0                           | NR               |
| 375       | 0                           | NR               | 505       | 313                         | NR               | 635       | 582                         | NR               | 765       | 12                          | NR               | 895       | 0                           | NR               |
| 380       | 0                           | NR               | 510       | 383                         | NR               | 640       | 520                         | NR               | 770       | 11                          | NR               | 900       | 0                           | NR               |
| 385       | 0                           | NR               | 515       | 448                         | NR               | 645       | 460                         | NR               | 775       | 9                           | NR               | 905       | 0                           | NR               |
| 390       | 2                           | NR               | 520       | 500                         | NR               | 650       | 406                         | NR               | 780       | 8                           | NR               | 910       | 0                           | NR               |
| 395       | 4                           | NR               | 525       | 539                         | NR               | 655       | 355                         | NR               | 785       | 7                           | NR               | 915       | 0                           | NR               |
| 400       | 6                           | NR               | 530       | 575                         | NR               | 660       | 309                         | NR               | 790       | 6                           | NR               | 920       | 0                           | NR               |
| 405       | 11                          | NR               | 535       | 606                         | NR               | 665       | 269                         | NR               | 795       | 5                           | NR               | 925       | 0                           | NR               |
| 410       | 22                          | NR               | 540       | 633                         | NR               | 670       | 231                         | NR               | 800       | 4                           | NR               | 930       | 0                           | NR               |
| 415       | 45                          | NR               | 545       | 666                         | NR               | 675       | 199                         | NR               | 805       | 4                           | NR               | 935       | 0                           | NR               |
| 420       | 96                          | NR               | 550       | 701                         | NR               | 680       | 171                         | NR               | 810       | 3                           | NR               | 940       | 0                           | NR               |
| 425       | 193                         | NR               | 555       | 743                         | NR               | 685       | 147                         | NR               | 815       | 3                           | NR               | 945       | 0                           | NR               |
| 430       | 341                         | NR               | 560       | 788                         | NR               | 690       | 126                         | NR               | 820       | 3                           | NR               | 950       | 0                           | NR               |
| 435       | 547                         | NR               | 565       | 837                         | NR               | 695       | 107                         | NR               | 825       | 2                           | NR               | 955       | 0                           | NR               |
| 440       | 799                         | NR               | 570       | 887                         | NR               | 700       | 92                          | NR               | 830       | 2                           | NR               | 960       | 0                           | NR               |
| 445       | 831                         | NR               | 575       | 931                         | NR               | 705       | 78                          | NR               | 835       | 2                           | NR               | 965       | 0                           | NR               |
| 450       | 461                         | NR               | 580       | 967                         | NR               | 710       | 67                          | NR               | 840       | 2                           | NR               | 970       | 0                           | NR               |
| 455       | 256                         | NR               | 585       | 990                         | NR               | 715       | 57                          | NR               | 845       | 1                           | NR               | 975       | 0                           | NR               |
| 460       | 176                         | NR               | 590       | 1000                        | NR               | 720       | 49                          | NR               | 850       | 1                           | NR               | 980       | 0                           | NR               |
| 465       | 107                         | NR               | 595       | 994                         | NR               | 725       | 42                          | NR               | 855       | 1                           | NR               | 985       | 0                           | NR               |
| 470       | 74                          | NR               | 600       | 973                         | NR               | 730       | 36                          | NR               | 860       | 1                           | NR               | 990       | 0                           | NR               |
| 475       | 67                          | NR               | 605       | 938                         | NR               | 735       | 31                          | NR               | 865       | 1                           | NR               | 995       | 0                           | NR               |
| 480       | 68                          | NR               | 610       | 892                         | NR               | 740       | 26                          | NR               | 870       | 1                           | NR               | 1000      | 0                           | NR               |
| 485       | 84                          | NR               | 615       | 838                         | NR               | 745       | 22                          | NR               | 875       | 1                           | NR               |           |                             |                  |

REPORT NUMBER: SP1-2407-184-5

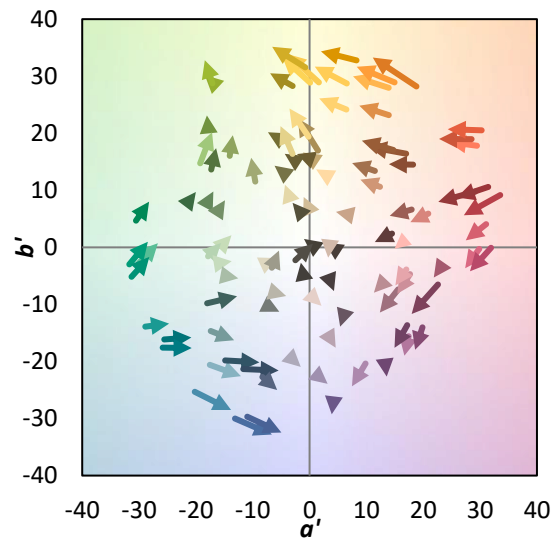
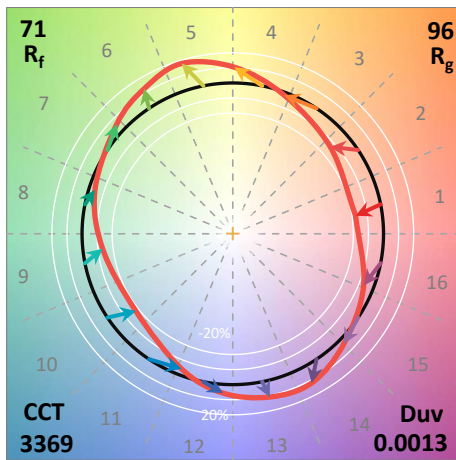
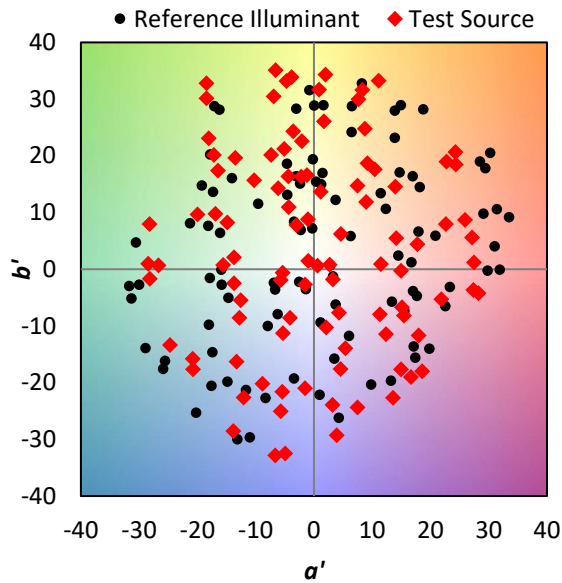
TM-30-18

### Summary

$R_f = 71.4$   
 $R_g = 96$   
 CIE  $R_a = 70.1$   
 $R_g = -40.2$



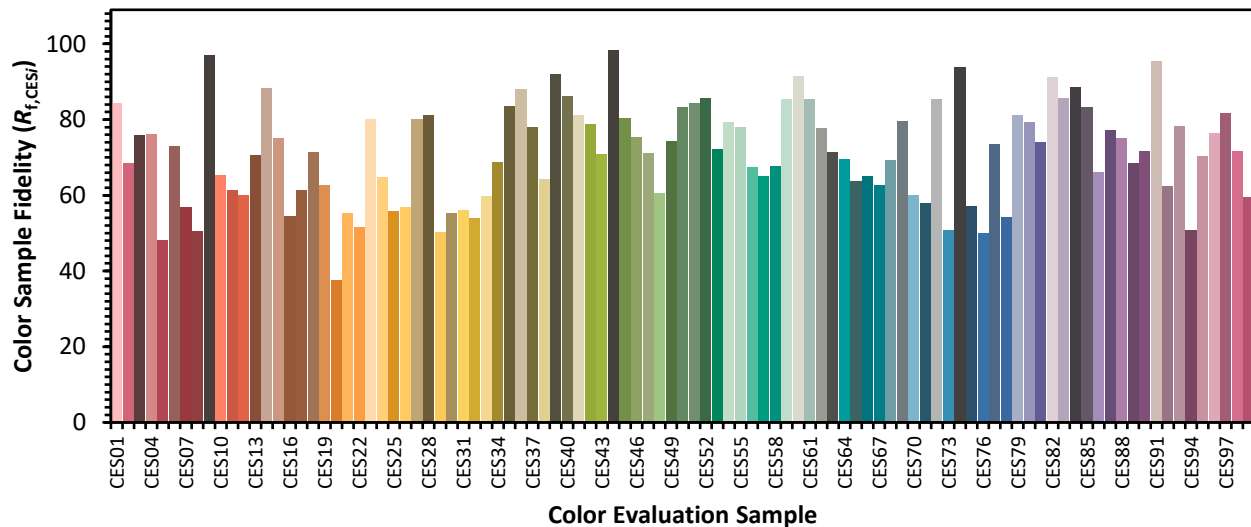
### Color Vector Graphics





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

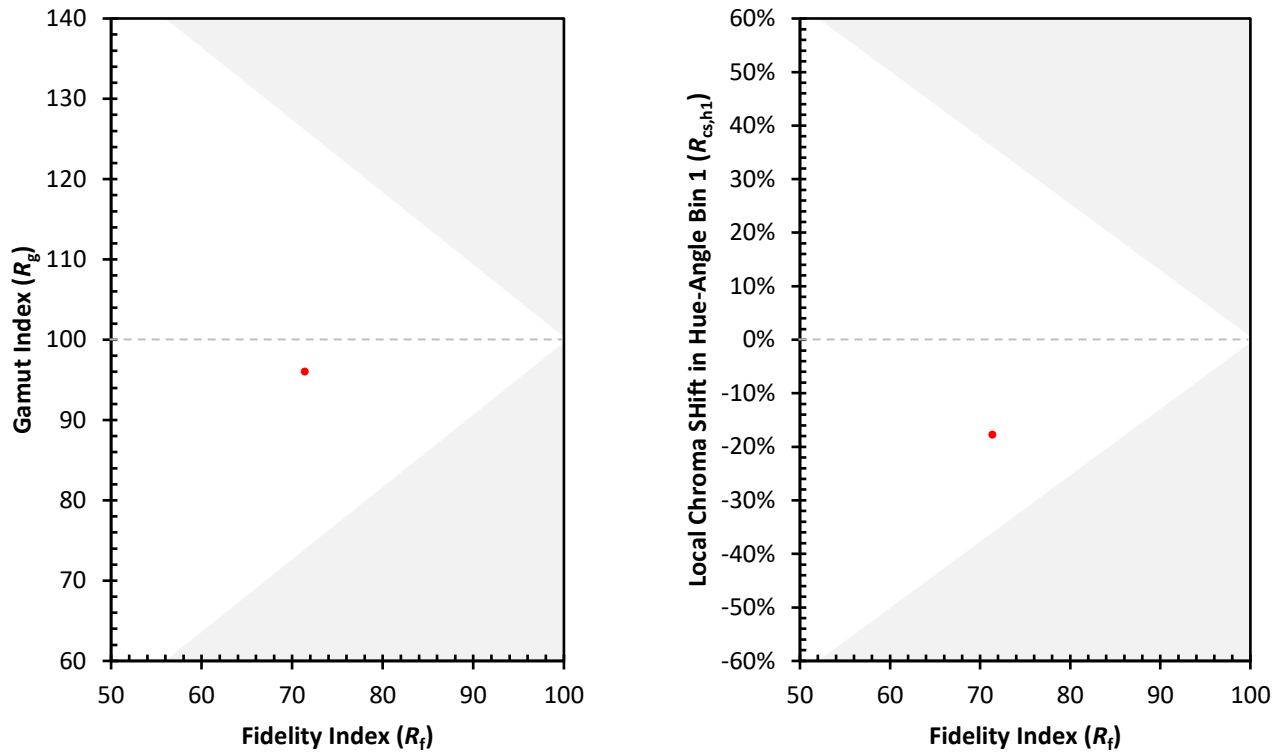
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 57 | CES51 = 84 | CES76 = 50 |
| CES02 = 62 | CES27 = 80 | CES52 = 86 | CES77 = 74 |
| CES03 = 31 | CES28 = 81 | CES53 = 72 | CES78 = 54 |
| CES04 = 70 | CES29 = 50 | CES54 = 79 | CES79 = 81 |
| CES05 = 48 | CES30 = 55 | CES55 = 78 | CES80 = 79 |
| CES06 = 51 | CES31 = 56 | CES56 = 67 | CES81 = 74 |
| CES07 = 40 | CES32 = 54 | CES57 = 65 | CES82 = 91 |
| CES08 = 39 | CES33 = 60 | CES58 = 68 | CES83 = 86 |
| CES09 = 29 | CES34 = 69 | CES59 = 85 | CES84 = 89 |
| CES10 = 75 | CES35 = 83 | CES60 = 91 | CES85 = 83 |
| CES11 = 58 | CES36 = 88 | CES61 = 85 | CES86 = 66 |
| CES12 = 64 | CES37 = 78 | CES62 = 78 | CES87 = 77 |
| CES13 = 43 | CES38 = 64 | CES63 = 71 | CES88 = 75 |
| CES14 = 74 | CES39 = 92 | CES64 = 70 | CES89 = 68 |
| CES15 = 71 | CES40 = 86 | CES65 = 64 | CES90 = 72 |
| CES16 = 47 | CES41 = 81 | CES66 = 65 | CES91 = 95 |
| CES17 = 50 | CES42 = 79 | CES67 = 63 | CES92 = 62 |
| CES18 = 56 | CES43 = 71 | CES68 = 69 | CES93 = 78 |
| CES19 = 72 | CES44 = 98 | CES69 = 80 | CES94 = 51 |
| CES20 = 65 | CES45 = 80 | CES70 = 60 | CES95 = 70 |
| CES21 = 87 | CES46 = 75 | CES71 = 58 | CES96 = 76 |
| CES22 = 79 | CES47 = 71 | CES72 = 85 | CES97 = 82 |
| CES23 = 92 | CES48 = 61 | CES73 = 51 | CES98 = 72 |
| CES24 = 91 | CES49 = 74 | CES74 = 94 | CES99 = 60 |
| CES25 = 72 | CES50 = 83 | CES75 = 57 |            |



Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)