

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: P1067526

Luminaire Tested: **NAV-SA5B-750-U-T4BC**

Issue Date: 08/07/2025

**Test Information**

Test Method: LM-79-08  
Report Number: P1067526  
Test Lab: INNOVATION CENTER(G3)  
Issue Date: 08/07/2025  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: LUMARK  
Catalog Number: NAV-SA5B-750-U-T4BC  
Description: Navion AREA AND ROADWAY LUMINAIRE 800mA 5xLight Square PACKAGE  
70CRI 5000K FIXTURE w/ TYPE IV ANGLED BACKLIGHT CONTROL  
Light Source: (70) 5000K CCT, 70 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 22168.5 lumens  
Efficiency: N/A  
Efficacy: 124.0 lumens/watt  
Luminous Opening: Rectangular (W 1' x L: 1.5' x H: 0')  
IES Classification: Type IV - Short  
BUG Rating: B0 - U0 - G4

Input Watts (W): 178.8  
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

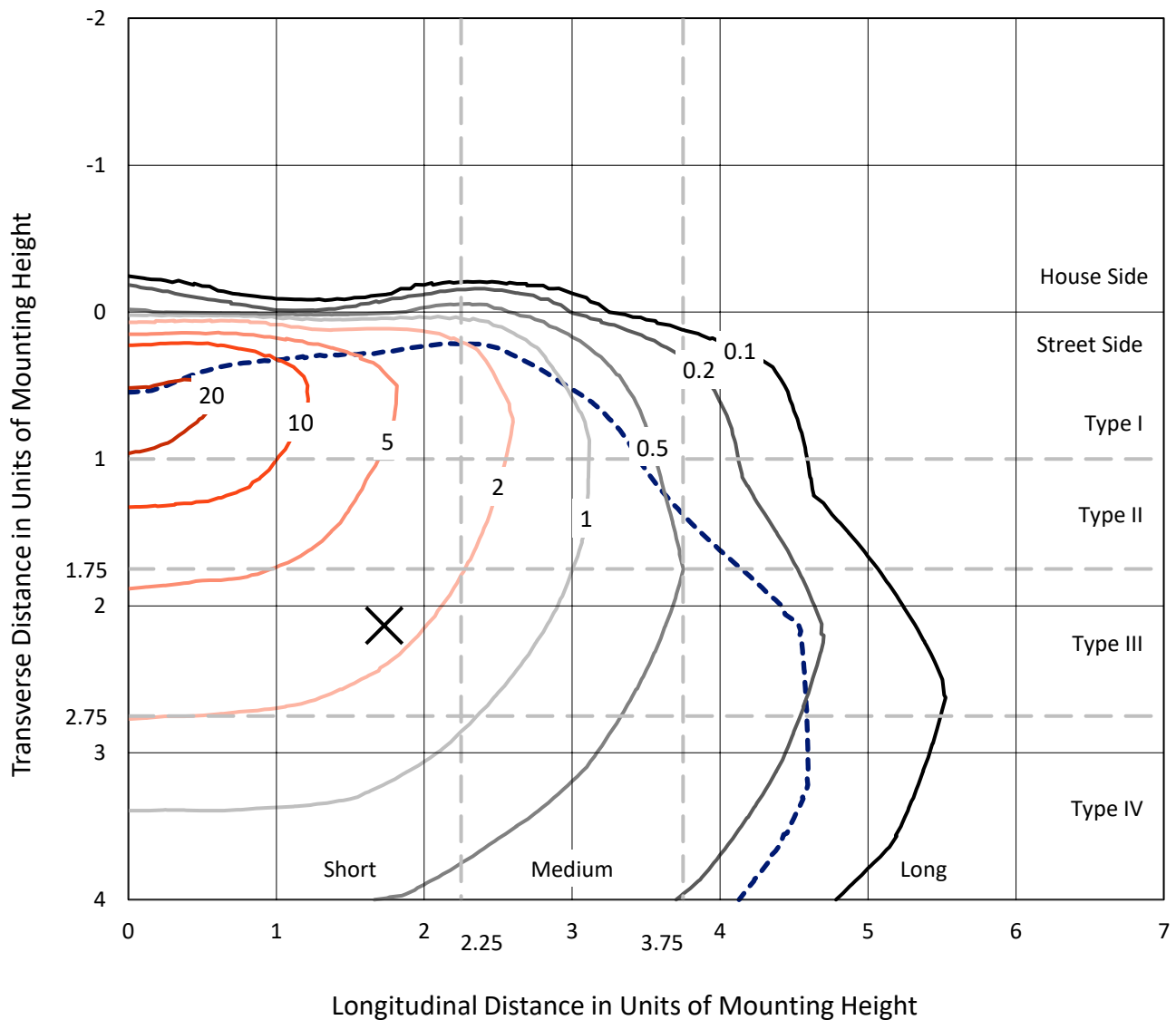


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## Iso-Footcandle Lines of Horizontal Illumination

× Max cd  
 - - - 1/2 Max cd

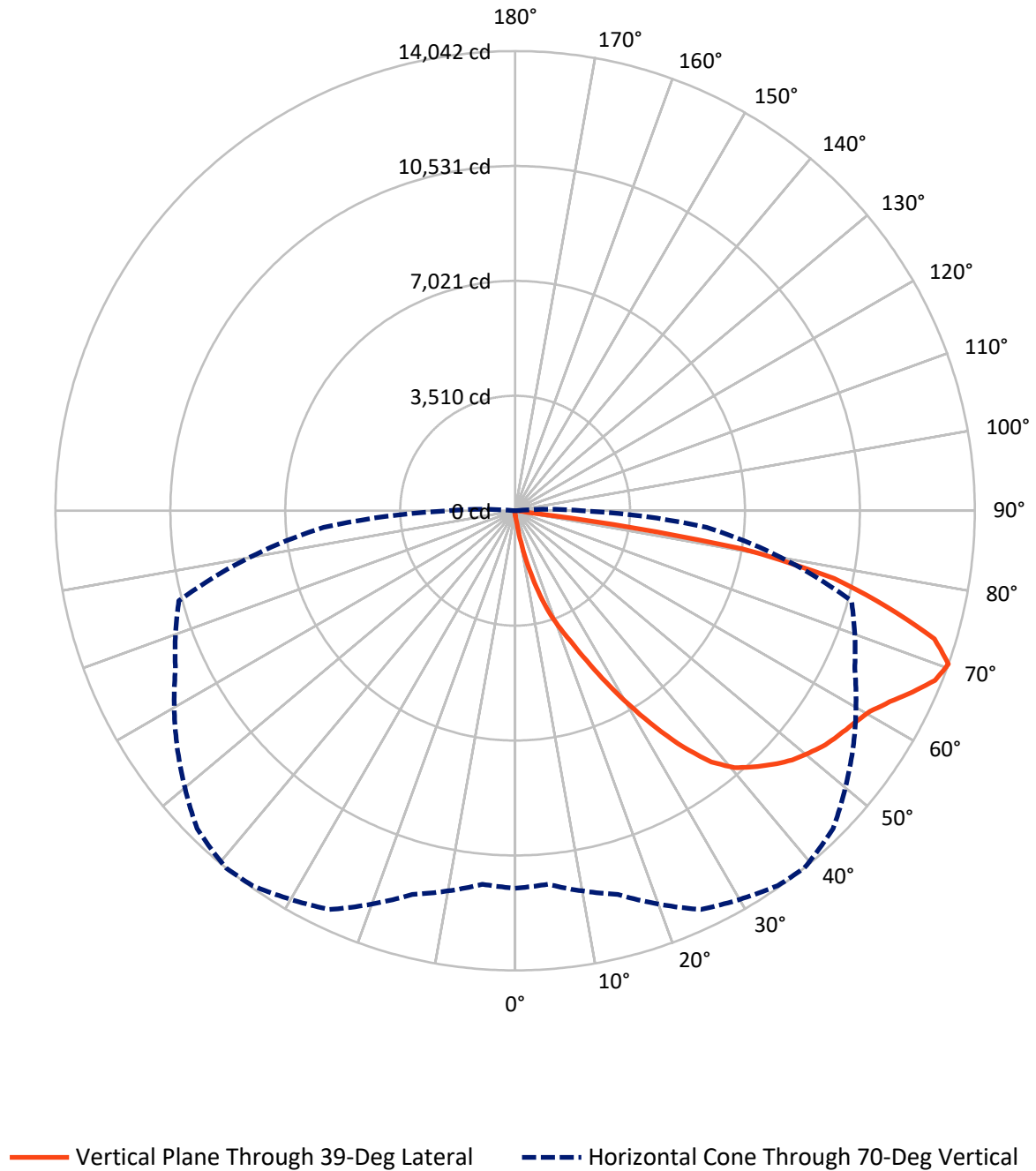


Based on 15 foot mounting height. Maximum calculated value = 24.2 fc  
 Type IV - Short - N/A

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## Luminous Intensity Polar Plot



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**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 68.3     | 0.0    | 68.3    |
|                    | % Fixture | 0.3      | 0.0    | 0.3     |
| <b>Street Side</b> | Lumens    | 22100.2  | 0.0    | 22100.2 |
|                    | % Fixture | 99.7     | 0.0    | 99.7    |
| <b>Total</b>       | Lumens    | 22168.5  | 0.0    | 22168.5 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**Coefficient of Utilization**

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 23.3    | 0.1       |
| 10°-20°   | 272.5   | 1.2       |
| 20°-30°   | 924.8   | 4.2       |
| 30°-40°   | 2173.5  | 9.8       |
| 40°-50°   | 3529.4  | 15.9      |
| 50°-60°   | 4472.4  | 20.2      |
| 60°-70°   | 5681.2  | 25.6      |
| 70°-80°   | 4616.0  | 20.8      |
| 80°-90°   | 475.3   | 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°    | 22168.5 | 100.0     |
| 0°-180°   | 22168.5 | 100.0     |



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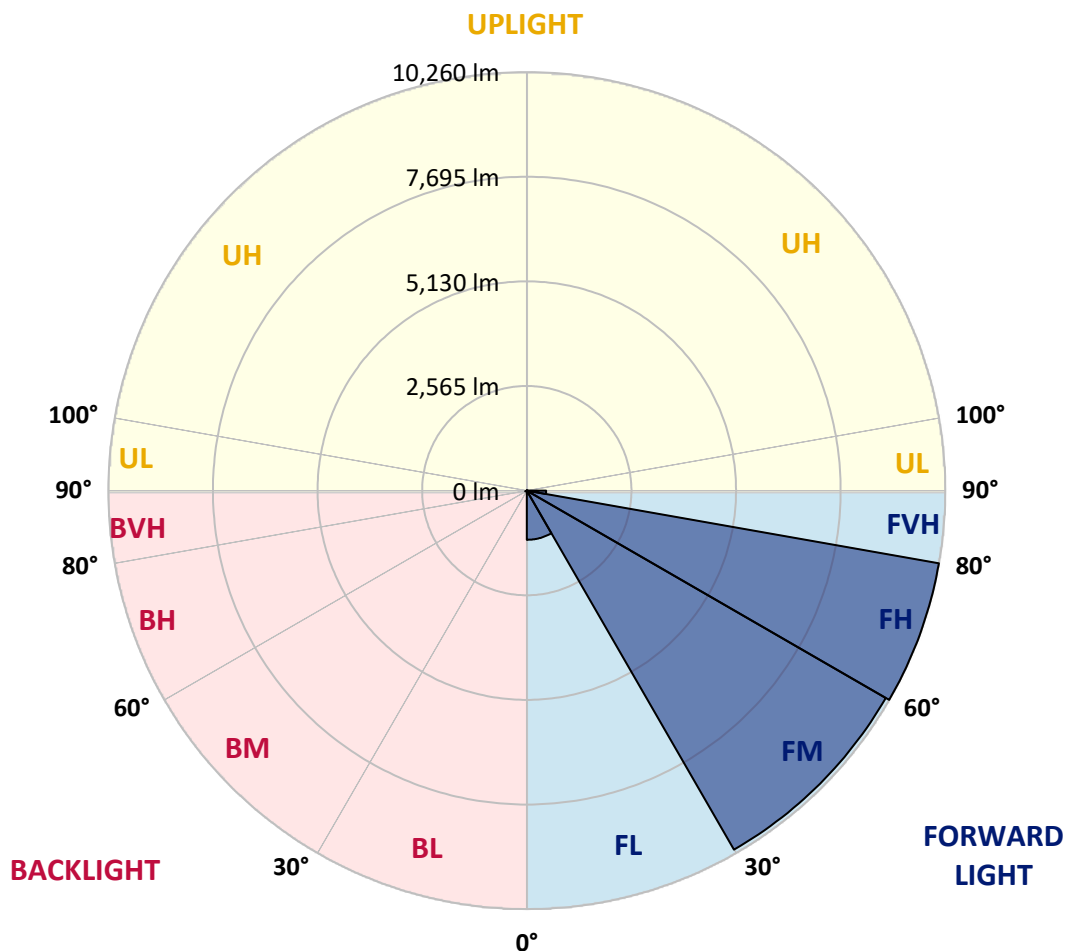
CATALOG NUMBER: NAV-SA5B-750-U-T4BC

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

| Zone |             | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |          |
|------|-------------|---------|-----------|-------------------------|------|----------|
|      |             |         |           | B                       | U    | G        |
| FL   | (0°-30°)    | 1205.9  | 5.4       |                         |      |          |
| FM   | (30°-60°)   | 10162.2 | 45.8      |                         |      |          |
| FH   | (60°-80°)   | 10259.6 | 46.3      |                         |      | G4/12000 |
| FVH  | (80°-90°)   | 472.4   | 2.1       |                         |      | G3/500   |
| BL   | (0°-30°)    | 14.8    | 0.1       | B0/110                  |      |          |
| BM   | (30°-60°)   | 13.1    | 0.1       | B0/220                  |      |          |
| BH   | (60°-80°)   | 37.5    | 0.2       | B0/110                  |      | G0/110   |
| BVH  | (80°-90°)   | 2.8     | 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



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 39°     | 45°     | 55°     | 65°     | 75°     | 85°    |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--------|
| 0°    | 120.4   | 120.4   | 120.4   | 120.4   | 120.4   | 120.4   | 120.4   | 120.4   | 120.4   | 120.4   | 120.4  |
| 2.5°  | 156.5   | 156.5   | 156.5   | 150.5   | 150.5   | 144.4   | 144.4   | 138.4   | 132.4   | 132.4   | 126.4  |
| 5°    | 294.9   | 300.9   | 282.9   | 246.8   | 222.7   | 210.7   | 198.6   | 168.5   | 150.5   | 138.4   | 126.4  |
| 7.5°  | 806.5   | 782.4   | 746.3   | 625.9   | 481.5   | 409.3   | 349.1   | 246.8   | 180.6   | 144.4   | 126.4  |
| 10°   | 1697.3  | 1631.1  | 1528.7  | 1366.2  | 1083.4  | 969.0   | 752.3   | 451.4   | 252.8   | 162.5   | 126.4  |
| 12.5° | 2491.7  | 2503.8  | 2377.4  | 2220.9  | 1877.8  | 1685.2  | 1390.3  | 848.6   | 397.2   | 192.6   | 126.4  |
| 15°   | 3093.6  | 3081.6  | 3033.4  | 2907.0  | 2600.1  | 2413.5  | 2148.7  | 1426.4  | 668.1   | 240.7   | 132.4  |
| 17.5° | 3569.1  | 3520.9  | 3502.9  | 3448.7  | 3250.1  | 3147.8  | 2858.9  | 2100.5  | 1059.3  | 325.0   | 138.4  |
| 20°   | 4044.5  | 4032.5  | 4014.5  | 3954.3  | 3821.9  | 3749.6  | 3526.9  | 2780.6  | 1576.9  | 463.4   | 150.5  |
| 22.5° | 4736.7  | 4670.5  | 4682.5  | 4550.1  | 4441.8  | 4315.4  | 4134.8  | 3502.9  | 2172.7  | 662.1   | 168.5  |
| 25°   | 5549.2  | 5543.2  | 5446.9  | 5386.7  | 5206.2  | 5067.7  | 4827.0  | 4201.0  | 2834.8  | 957.0   | 186.6  |
| 27.5° | 6506.2  | 6440.0  | 6397.8  | 6295.5  | 6109.0  | 5952.5  | 5621.4  | 4893.2  | 3551.0  | 1288.0  | 210.7  |
| 30°   | 7505.3  | 7505.3  | 7427.0  | 7270.6  | 7090.0  | 6897.4  | 6560.4  | 5621.4  | 4261.2  | 1709.3  | 240.7  |
| 32.5° | 8672.9  | 8697.0  | 8504.4  | 8269.7  | 8034.9  | 7902.5  | 7463.2  | 6446.0  | 4941.3  | 2190.8  | 276.9  |
| 35°   | 9804.4  | 9774.3  | 9455.3  | 9196.5  | 9022.0  | 8877.5  | 8504.4  | 7348.8  | 5711.7  | 2750.5  | 325.0  |
| 37.5° | 10887.8 | 10809.5 | 10279.9 | 9912.8  | 9834.5  | 9738.2  | 9365.1  | 8251.6  | 6476.1  | 3370.5  | 385.2  |
| 40°   | 11664.2 | 11543.8 | 10996.1 | 10490.5 | 10376.2 | 10322.0 | 10033.1 | 9070.1  | 7282.6  | 4062.6  | 463.4  |
| 42.5° | 12001.2 | 11862.8 | 11483.6 | 11074.4 | 10821.6 | 10695.2 | 10442.4 | 9738.2  | 8089.1  | 4833.0  | 577.8  |
| 45°   | 12067.4 | 11959.1 | 11688.3 | 11592.0 | 11248.9 | 11056.3 | 10713.2 | 10213.7 | 8841.4  | 5597.4  | 734.3  |
| 47.5° | 11826.7 | 11778.5 | 11616.0 | 11820.7 | 11646.1 | 11381.3 | 10966.0 | 10568.8 | 9509.5  | 6524.2  | 951.0  |
| 50°   | 11236.9 | 11200.8 | 11279.0 | 11814.7 | 11935.0 | 11634.1 | 11242.9 | 10845.6 | 10087.3 | 7481.2  | 1257.9 |
| 52.5° | 10442.4 | 10436.4 | 10803.5 | 11658.2 | 12061.4 | 11874.8 | 11513.7 | 11122.5 | 10544.7 | 8408.1  | 1691.2 |
| 55°   | 9575.7  | 9678.0  | 10322.0 | 11513.7 | 12133.6 | 12049.4 | 11778.5 | 11369.3 | 10954.0 | 9268.8  | 2389.4 |
| 57.5° | 9503.5  | 9461.4  | 10081.3 | 11453.5 | 12175.8 | 12223.9 | 12043.4 | 11628.1 | 11303.1 | 9972.9  | 3322.3 |
| 60°   | 10225.7 | 10129.4 | 10364.2 | 11579.9 | 12362.4 | 12446.6 | 12308.2 | 11826.7 | 11652.2 | 10526.7 | 4550.1 |
| 62.5° | 11062.3 | 10972.0 | 11092.4 | 12067.4 | 12729.5 | 12849.9 | 12675.3 | 12031.3 | 11935.0 | 10911.9 | 5868.2 |
| 65°   | 11730.4 | 11658.2 | 11886.9 | 12795.7 | 13241.1 | 13343.4 | 13223.0 | 12410.5 | 12061.4 | 11224.8 | 6939.5 |
| 67.5° | 11838.7 | 11748.4 | 12223.9 | 13283.2 | 13758.7 | 13830.9 | 13734.6 | 12777.6 | 12019.3 | 11248.9 | 7186.3 |
| 70°   | 11531.8 | 11453.5 | 12133.6 | 13439.7 | 13981.4 | 14041.6 | 13734.6 | 12603.1 | 11447.5 | 10635.0 | 5874.2 |
| 72.5° | 10586.8 | 10647.0 | 11525.8 | 13060.5 | 13674.4 | 13397.6 | 12747.5 | 11724.4 | 10707.2 | 9016.0  | 4122.8 |
| 75°   | 9118.3  | 9184.5  | 10352.1 | 12019.3 | 12067.4 | 11730.4 | 11381.3 | 10785.5 | 9581.7  | 5940.4  | 2858.9 |
| 77.5° | 6482.1  | 6247.4  | 7992.8  | 9924.8  | 9750.2  | 9966.9  | 9997.0  | 8973.8  | 8022.9  | 3093.6  | 1913.9 |
| 80°   | 638.0   | 541.7   | 1005.1  | 2846.8  | 6289.5  | 7029.8  | 7318.7  | 6915.5  | 5916.4  | 1384.3  | 1005.1 |
| 82.5° | 138.4   | 138.4   | 150.5   | 162.5   | 252.8   | 379.2   | 1739.4  | 4261.2  | 3821.9  | 704.2   | 325.0  |
| 85°   | 78.2    | 78.2    | 96.3    | 114.4   | 150.5   | 168.5   | 198.6   | 264.8   | 1029.2  | 252.8   | 60.2   |
| 87.5° | 60.2    | 66.2    | 78.2    | 96.3    | 126.4   | 138.4   | 168.5   | 210.7   | 258.8   | 234.7   | 18.1   |
| 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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CATALOG NUMBER: NAV-SA5B-750-U-T4BC

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°   | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 120.4  | 120.4 | 120.4 | 120.4 | 120.4 | 120.4 | 120.4 | 120.4 | 120.4 | 120.4 | 120.4 |
| 2.5°  | 126.4  | 120.4 | 114.4 | 108.3 | 102.3 | 102.3 | 96.3  | 96.3  | 96.3  | 96.3  | 96.3  |
| 5°    | 120.4  | 114.4 | 108.3 | 96.3  | 90.3  | 84.3  | 78.2  | 78.2  | 78.2  | 78.2  | 78.2  |
| 7.5°  | 120.4  | 114.4 | 102.3 | 90.3  | 78.2  | 72.2  | 66.2  | 60.2  | 60.2  | 66.2  | 66.2  |
| 10°   | 120.4  | 108.3 | 90.3  | 78.2  | 66.2  | 60.2  | 54.2  | 48.1  | 48.1  | 48.1  | 48.1  |
| 12.5° | 114.4  | 102.3 | 84.3  | 72.2  | 60.2  | 48.1  | 36.1  | 30.1  | 30.1  | 30.1  | 30.1  |
| 15°   | 108.3  | 96.3  | 78.2  | 60.2  | 42.1  | 30.1  | 24.1  | 18.1  | 18.1  | 18.1  | 18.1  |
| 17.5° | 108.3  | 90.3  | 72.2  | 54.2  | 30.1  | 18.1  | 12.0  | 6.0   | 6.0   | 6.0   | 12.0  |
| 20°   | 108.3  | 90.3  | 66.2  | 42.1  | 18.1  | 12.0  | 12.0  | 6.0   | 0.0   | 6.0   | 6.0   |
| 22.5° | 108.3  | 84.3  | 54.2  | 30.1  | 18.1  | 12.0  | 6.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 25°   | 114.4  | 84.3  | 48.1  | 24.1  | 12.0  | 6.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 27.5° | 114.4  | 78.2  | 42.1  | 18.1  | 6.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 30°   | 120.4  | 78.2  | 36.1  | 12.0  | 6.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 32.5° | 120.4  | 72.2  | 24.1  | 12.0  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 35°   | 120.4  | 66.2  | 18.1  | 6.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 37.5° | 120.4  | 60.2  | 18.1  | 6.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 40°   | 126.4  | 54.2  | 12.0  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 42.5° | 132.4  | 48.1  | 12.0  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 45°   | 138.4  | 42.1  | 6.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 47.5° | 156.5  | 42.1  | 6.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 50°   | 180.6  | 42.1  | 6.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 52.5° | 216.7  | 42.1  | 6.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 55°   | 282.9  | 36.1  | 6.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 57.5° | 409.3  | 36.1  | 6.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 60°   | 686.1  | 36.1  | 6.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 62.5° | 1203.7 | 36.1  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 65°   | 2034.3 | 36.1  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 67.5° | 2654.2 | 42.1  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 70°   | 2016.3 | 36.1  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 72.5° | 963.0  | 24.1  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 75°   | 427.3  | 24.1  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 77.5° | 186.6  | 18.1  | 6.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 80°   | 72.2   | 12.0  | 6.0   | 6.0   | 6.0   | 6.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 82.5° | 30.1   | 12.0  | 6.0   | 6.0   | 6.0   | 6.0   | 6.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 85°   | 18.1   | 12.0  | 12.0  | 12.0  | 6.0   | 6.0   | 6.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 87.5° | 12.0   | 12.0  | 12.0  | 12.0  | 12.0  | 6.0   | 6.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 90°   | 0.0    | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |

LM-79-2019: Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Report Prepared for

Cooper Lighting Solutions

McGraw-Edison

Report Number: SP1-2407-184-6

Test Date: 10/10/2024

Luminaire Tested: GSS-SB1A-750-U-5WQ

Data in this report applies to families of products including GSS-SB1A-750-U-5WQ

### Test Information

Test Method: LM-79-2019  
 Report Number: SP1-2407-184-6  
 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-750-U-5WQ**  
 Description: GALLEON II SITE SLIM 1SQ 350MA 5WQ HIGH DENSITY LIGHTSQUARE WITH 70 CRI  
 5000K CCT 26 LEDS

### Spectral Parameters

|                           |          |           |      |      |       |
|---------------------------|----------|-----------|------|------|-------|
| CCT (K):                  | 4896     | CRI (Ra): | 70.2 |      |       |
| CIE u':                   | 0.2101   | R1:       | 68.1 | R9:  | -35.1 |
| CIE v':                   | 0.4901   | R2:       | 73.9 | R10: | 39.3  |
| Duv:                      | 0.0035   | R3:       | 79.4 | R11: | 71.1  |
| CIE x:                    | 0.3489   | R4:       | 72.1 | R12: | 43.8  |
| CIE y:                    | 0.3618   | R5:       | 69.2 | R13: | 68.1  |
| CIE z:                    | 0.2893   | R6:       | 65.7 | R14: | 88.4  |
| Peak Wavelength (nm):     | 443      | R7:       | 78.1 | R15: | 59.7  |
| Dominant Wavelength (nm): | 570      | R8:       | 55.3 |      |       |
| Purity:                   | 13.25435 |           |      |      |       |
| Rf:                       | 70.7     |           |      |      |       |
| Rg:                       | 96.8     |           |      |      |       |



### Test Conditions

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

REPORT NUMBER: SP1-2407-184-6

| 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: SP1-2407-184-6

**CIE 1931 Chromaticity Diagram**



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



CCT = 4896K  
 CIE  $x$  = 0.3489  
 CIE  $y$  = 0.3618  
 Duv = 0.0035

REPORT NUMBER: SP1-2407-184-6

### Photopic Flux vs. Wavelength



### Photopic Lumens: NR

| λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) |
|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|
| 360    | 0                        | NR            | 490    | 118                      | NR            | 620    | 401                      | NR            | 750    | 12                       | NR            | 880    | 0                        | NR            |
| 365    | 0                        | NR            | 495    | 168                      | NR            | 625    | 365                      | NR            | 755    | 10                       | NR            | 885    | 0                        | NR            |
| 370    | 0                        | NR            | 500    | 230                      | NR            | 630    | 331                      | NR            | 760    | 9                        | NR            | 890    | 0                        | NR            |
| 375    | 0                        | NR            | 505    | 299                      | NR            | 635    | 298                      | NR            | 765    | 8                        | NR            | 895    | 0                        | NR            |
| 380    | 0                        | NR            | 510    | 362                      | NR            | 640    | 266                      | NR            | 770    | 6                        | NR            | 900    | 0                        | NR            |
| 385    | 2                        | NR            | 515    | 418                      | NR            | 645    | 236                      | NR            | 775    | 6                        | NR            | 905    | 0                        | NR            |
| 390    | 4                        | NR            | 520    | 461                      | NR            | 650    | 209                      | NR            | 780    | 5                        | NR            | 910    | 0                        | NR            |
| 395    | 6                        | NR            | 525    | 491                      | NR            | 655    | 184                      | NR            | 785    | 4                        | NR            | 915    | 0                        | NR            |
| 400    | 9                        | NR            | 530    | 514                      | NR            | 660    | 160                      | NR            | 790    | 4                        | NR            | 920    | 0                        | NR            |
| 405    | 14                       | NR            | 535    | 530                      | NR            | 665    | 140                      | NR            | 795    | 3                        | NR            | 925    | 0                        | NR            |
| 410    | 27                       | NR            | 540    | 539                      | NR            | 670    | 122                      | NR            | 800    | 3                        | NR            | 930    | 0                        | NR            |
| 415    | 55                       | NR            | 545    | 549                      | NR            | 675    | 106                      | NR            | 805    | 2                        | NR            | 935    | 0                        | NR            |
| 420    | 115                      | NR            | 550    | 557                      | NR            | 680    | 92                       | NR            | 810    | 2                        | NR            | 940    | 0                        | NR            |
| 425    | 226                      | NR            | 555    | 565                      | NR            | 685    | 79                       | NR            | 815    | 2                        | NR            | 945    | 0                        | NR            |
| 430    | 395                      | NR            | 560    | 572                      | NR            | 690    | 68                       | NR            | 820    | 2                        | NR            | 950    | 0                        | NR            |
| 435    | 648                      | NR            | 565    | 580                      | NR            | 695    | 59                       | NR            | 825    | 1                        | NR            | 955    | 0                        | NR            |
| 440    | 937                      | NR            | 570    | 586                      | NR            | 700    | 51                       | NR            | 830    | 1                        | NR            | 960    | 0                        | NR            |
| 445    | 953                      | NR            | 575    | 588                      | NR            | 705    | 44                       | NR            | 835    | 1                        | NR            | 965    | 0                        | NR            |
| 450    | 591                      | NR            | 580    | 588                      | NR            | 710    | 38                       | NR            | 840    | 1                        | NR            | 970    | 0                        | NR            |
| 455    | 334                      | NR            | 585    | 580                      | NR            | 715    | 32                       | NR            | 845    | 1                        | NR            | 975    | 0                        | NR            |
| 460    | 221                      | NR            | 590    | 568                      | NR            | 720    | 28                       | NR            | 850    | 1                        | NR            | 980    | 0                        | NR            |
| 465    | 140                      | NR            | 595    | 550                      | NR            | 725    | 24                       | NR            | 855    | 1                        | NR            | 985    | 0                        | NR            |
| 470    | 93                       | NR            | 600    | 527                      | NR            | 730    | 21                       | NR            | 860    | 1                        | NR            | 990    | 0                        | NR            |
| 475    | 79                       | NR            | 605    | 499                      | NR            | 735    | 18                       | NR            | 865    | 0                        | NR            | 995    | 0                        | NR            |
| 480    | 76                       | NR            | 610    | 469                      | NR            | 740    | 15                       | NR            | 870    | 0                        | NR            | 1000   | 0                        | NR            |
| 485    | 87                       | NR            | 615    | 435                      | NR            | 745    | 13                       | NR            | 875    | 0                        | NR            |        |                          |               |

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### Scotopic Flux vs. Wavelength



Scotopic Lumens: NR

S/P: 1.7

| λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(Φ/nm) |
|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|
| 360       | 0                           | NR               | 490       | 118                         | NR               | 620       | 401                         | NR               | 750       | 12                          | NR               | 880       | 0                           | NR               |
| 365       | 0                           | NR               | 495       | 168                         | NR               | 625       | 365                         | NR               | 755       | 10                          | NR               | 885       | 0                           | NR               |
| 370       | 0                           | NR               | 500       | 230                         | NR               | 630       | 331                         | NR               | 760       | 9                           | NR               | 890       | 0                           | NR               |
| 375       | 0                           | NR               | 505       | 299                         | NR               | 635       | 298                         | NR               | 765       | 8                           | NR               | 895       | 0                           | NR               |
| 380       | 0                           | NR               | 510       | 362                         | NR               | 640       | 266                         | NR               | 770       | 6                           | NR               | 900       | 0                           | NR               |
| 385       | 2                           | NR               | 515       | 418                         | NR               | 645       | 236                         | NR               | 775       | 6                           | NR               | 905       | 0                           | NR               |
| 390       | 4                           | NR               | 520       | 461                         | NR               | 650       | 209                         | NR               | 780       | 5                           | NR               | 910       | 0                           | NR               |
| 395       | 6                           | NR               | 525       | 491                         | NR               | 655       | 184                         | NR               | 785       | 4                           | NR               | 915       | 0                           | NR               |
| 400       | 9                           | NR               | 530       | 514                         | NR               | 660       | 160                         | NR               | 790       | 4                           | NR               | 920       | 0                           | NR               |
| 405       | 14                          | NR               | 535       | 530                         | NR               | 665       | 140                         | NR               | 795       | 3                           | NR               | 925       | 0                           | NR               |
| 410       | 27                          | NR               | 540       | 539                         | NR               | 670       | 122                         | NR               | 800       | 3                           | NR               | 930       | 0                           | NR               |
| 415       | 55                          | NR               | 545       | 549                         | NR               | 675       | 106                         | NR               | 805       | 2                           | NR               | 935       | 0                           | NR               |
| 420       | 115                         | NR               | 550       | 557                         | NR               | 680       | 92                          | NR               | 810       | 2                           | NR               | 940       | 0                           | NR               |
| 425       | 226                         | NR               | 555       | 565                         | NR               | 685       | 79                          | NR               | 815       | 2                           | NR               | 945       | 0                           | NR               |
| 430       | 395                         | NR               | 560       | 572                         | NR               | 690       | 68                          | NR               | 820       | 2                           | NR               | 950       | 0                           | NR               |
| 435       | 648                         | NR               | 565       | 580                         | NR               | 695       | 59                          | NR               | 825       | 1                           | NR               | 955       | 0                           | NR               |
| 440       | 937                         | NR               | 570       | 586                         | NR               | 700       | 51                          | NR               | 830       | 1                           | NR               | 960       | 0                           | NR               |
| 445       | 953                         | NR               | 575       | 588                         | NR               | 705       | 44                          | NR               | 835       | 1                           | NR               | 965       | 0                           | NR               |
| 450       | 591                         | NR               | 580       | 588                         | NR               | 710       | 38                          | NR               | 840       | 1                           | NR               | 970       | 0                           | NR               |
| 455       | 334                         | NR               | 585       | 580                         | NR               | 715       | 32                          | NR               | 845       | 1                           | NR               | 975       | 0                           | NR               |
| 460       | 221                         | NR               | 590       | 568                         | NR               | 720       | 28                          | NR               | 850       | 1                           | NR               | 980       | 0                           | NR               |
| 465       | 140                         | NR               | 595       | 550                         | NR               | 725       | 24                          | NR               | 855       | 1                           | NR               | 985       | 0                           | NR               |
| 470       | 93                          | NR               | 600       | 527                         | NR               | 730       | 21                          | NR               | 860       | 1                           | NR               | 990       | 0                           | NR               |
| 475       | 79                          | NR               | 605       | 499                         | NR               | 735       | 18                          | NR               | 865       | 0                           | NR               | 995       | 0                           | NR               |
| 480       | 76                          | NR               | 610       | 469                         | NR               | 740       | 15                          | NR               | 870       | 0                           | NR               | 1000      | 0                           | NR               |
| 485       | 87                          | NR               | 615       | 435                         | NR               | 745       | 13                          | NR               | 875       | 0                           | NR               |           |                             |                  |

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### Melanopic Flux vs. Wavelength



Melanopic Lumens: NR

M/P: 3.37

| $\lambda$<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               | 118                                    | NR                             | 620               | 401                                    | NR                             | 750               | 12                                     | NR                             | 880               | 0                                      | NR                             |
| 365               | 0                                      | NR                             | 495               | 168                                    | NR                             | 625               | 365                                    | NR                             | 755               | 10                                     | NR                             | 885               | 0                                      | NR                             |
| 370               | 0                                      | NR                             | 500               | 230                                    | NR                             | 630               | 331                                    | NR                             | 760               | 9                                      | NR                             | 890               | 0                                      | NR                             |
| 375               | 0                                      | NR                             | 505               | 299                                    | NR                             | 635               | 298                                    | NR                             | 765               | 8                                      | NR                             | 895               | 0                                      | NR                             |
| 380               | 0                                      | NR                             | 510               | 362                                    | NR                             | 640               | 266                                    | NR                             | 770               | 6                                      | NR                             | 900               | 0                                      | NR                             |
| 385               | 2                                      | NR                             | 515               | 418                                    | NR                             | 645               | 236                                    | NR                             | 775               | 6                                      | NR                             | 905               | 0                                      | NR                             |
| 390               | 4                                      | NR                             | 520               | 461                                    | NR                             | 650               | 209                                    | NR                             | 780               | 5                                      | NR                             | 910               | 0                                      | NR                             |
| 395               | 6                                      | NR                             | 525               | 491                                    | NR                             | 655               | 184                                    | NR                             | 785               | 4                                      | NR                             | 915               | 0                                      | NR                             |
| 400               | 9                                      | NR                             | 530               | 514                                    | NR                             | 660               | 160                                    | NR                             | 790               | 4                                      | NR                             | 920               | 0                                      | NR                             |
| 405               | 14                                     | NR                             | 535               | 530                                    | NR                             | 665               | 140                                    | NR                             | 795               | 3                                      | NR                             | 925               | 0                                      | NR                             |
| 410               | 27                                     | NR                             | 540               | 539                                    | NR                             | 670               | 122                                    | NR                             | 800               | 3                                      | NR                             | 930               | 0                                      | NR                             |
| 415               | 55                                     | NR                             | 545               | 549                                    | NR                             | 675               | 106                                    | NR                             | 805               | 2                                      | NR                             | 935               | 0                                      | NR                             |
| 420               | 115                                    | NR                             | 550               | 557                                    | NR                             | 680               | 92                                     | NR                             | 810               | 2                                      | NR                             | 940               | 0                                      | NR                             |
| 425               | 226                                    | NR                             | 555               | 565                                    | NR                             | 685               | 79                                     | NR                             | 815               | 2                                      | NR                             | 945               | 0                                      | NR                             |
| 430               | 395                                    | NR                             | 560               | 572                                    | NR                             | 690               | 68                                     | NR                             | 820               | 2                                      | NR                             | 950               | 0                                      | NR                             |
| 435               | 648                                    | NR                             | 565               | 580                                    | NR                             | 695               | 59                                     | NR                             | 825               | 1                                      | NR                             | 955               | 0                                      | NR                             |
| 440               | 937                                    | NR                             | 570               | 586                                    | NR                             | 700               | 51                                     | NR                             | 830               | 1                                      | NR                             | 960               | 0                                      | NR                             |
| 445               | 953                                    | NR                             | 575               | 588                                    | NR                             | 705               | 44                                     | NR                             | 835               | 1                                      | NR                             | 965               | 0                                      | NR                             |
| 450               | 591                                    | NR                             | 580               | 588                                    | NR                             | 710               | 38                                     | NR                             | 840               | 1                                      | NR                             | 970               | 0                                      | NR                             |
| 455               | 334                                    | NR                             | 585               | 580                                    | NR                             | 715               | 32                                     | NR                             | 845               | 1                                      | NR                             | 975               | 0                                      | NR                             |
| 460               | 221                                    | NR                             | 590               | 568                                    | NR                             | 720               | 28                                     | NR                             | 850               | 1                                      | NR                             | 980               | 0                                      | NR                             |
| 465               | 140                                    | NR                             | 595               | 550                                    | NR                             | 725               | 24                                     | NR                             | 855               | 1                                      | NR                             | 985               | 0                                      | NR                             |
| 470               | 93                                     | NR                             | 600               | 527                                    | NR                             | 730               | 21                                     | NR                             | 860               | 1                                      | NR                             | 990               | 0                                      | NR                             |
| 475               | 79                                     | NR                             | 605               | 499                                    | NR                             | 735               | 18                                     | NR                             | 865               | 0                                      | NR                             | 995               | 0                                      | NR                             |
| 480               | 76                                     | NR                             | 610               | 469                                    | NR                             | 740               | 15                                     | NR                             | 870               | 0                                      | NR                             | 1000              | 0                                      | NR                             |
| 485               | 87                                     | NR                             | 615               | 435                                    | NR                             | 745               | 13                                     | NR                             | 875               | 0                                      | NR                             |                   |                                        |                                |

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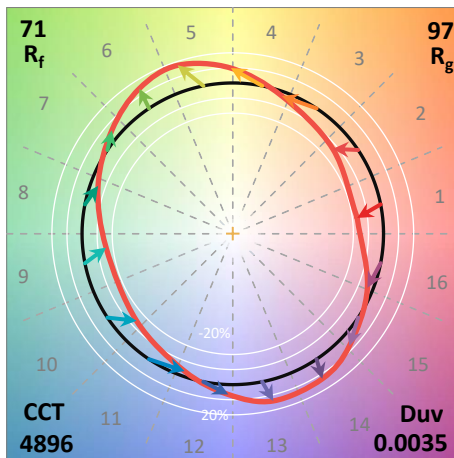
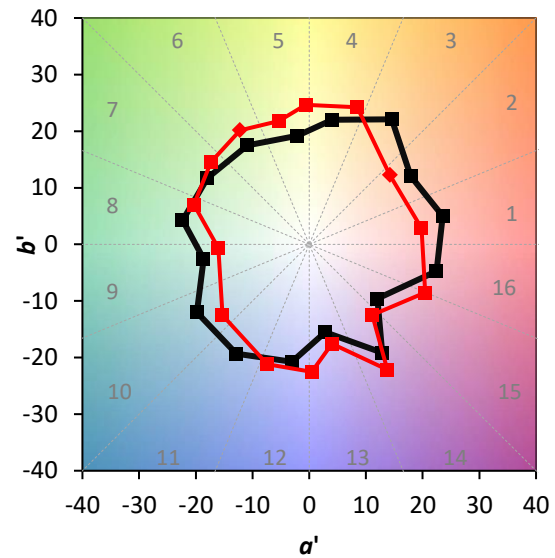
TM-30-18

### Summary

$R_f = 70.7$   
 $R_g = 96.8$   
 $CIE R_a = 70.2$   
 $R_g = -35.1$



### Color Vector Graphics

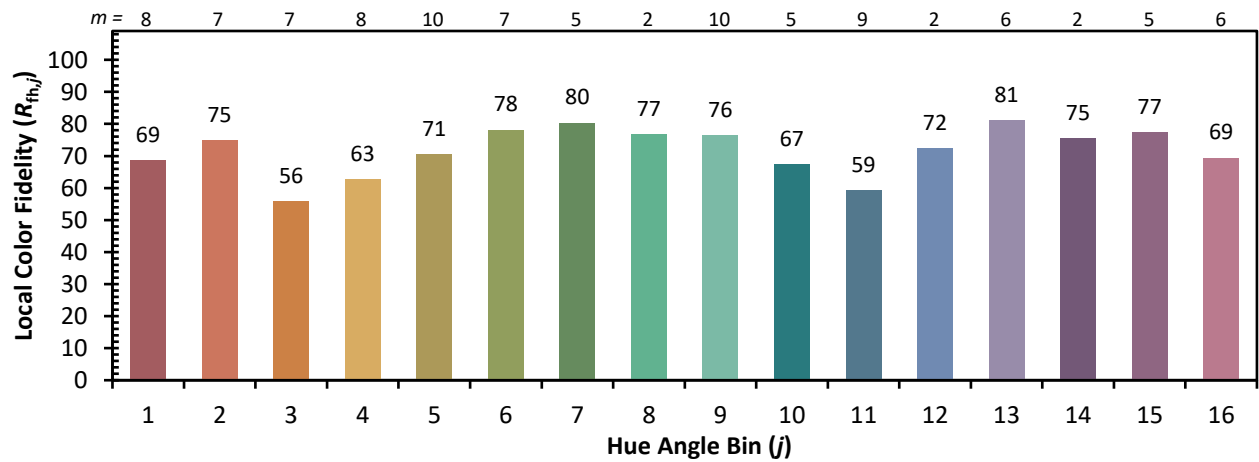
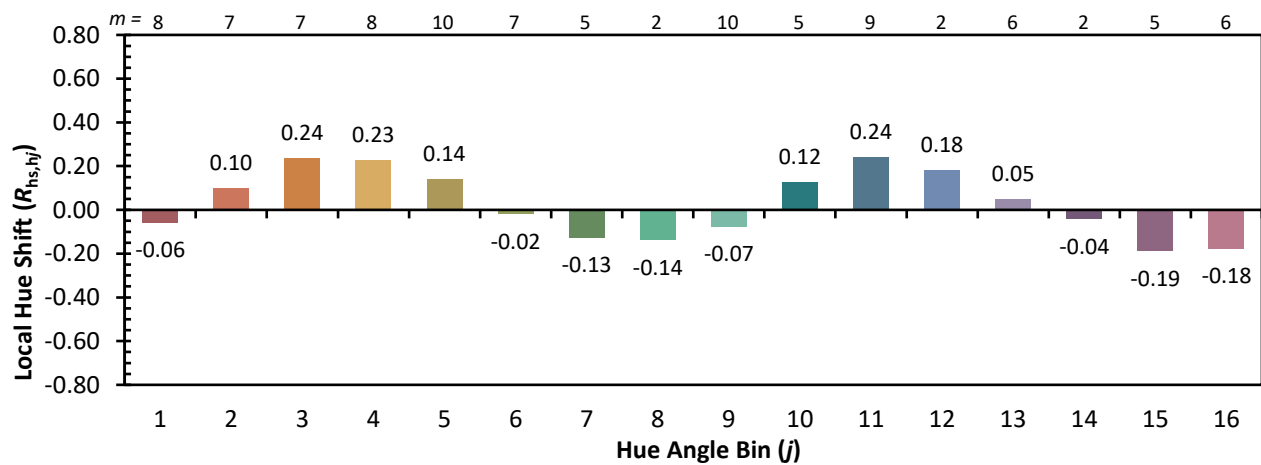
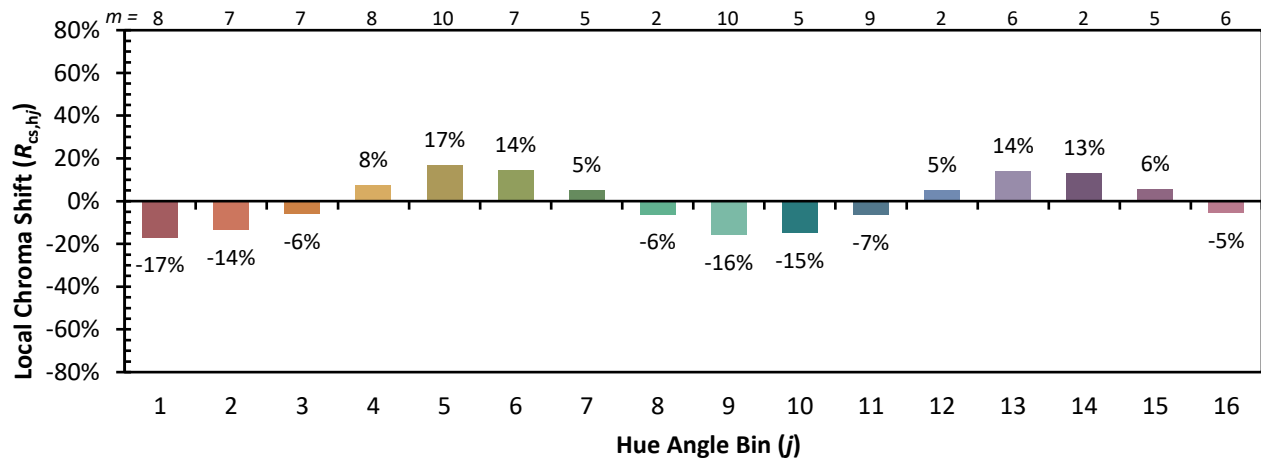


Individual Sample Fidelity Index ( $R_{f,i}$ )

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 53 | CES51 = 87 | CES76 = 42 |
| CES02 = 59 | CES27 = 78 | CES52 = 88 | CES77 = 64 |
| CES03 = 30 | CES28 = 76 | CES53 = 74 | CES78 = 45 |
| CES04 = 69 | CES29 = 48 | CES54 = 80 | CES79 = 74 |
| CES05 = 46 | CES30 = 56 | CES55 = 79 | CES80 = 71 |
| CES06 = 50 | CES31 = 54 | CES56 = 68 | CES81 = 72 |
| CES07 = 39 | CES32 = 50 | CES57 = 65 | CES82 = 88 |
| CES08 = 38 | CES33 = 60 | CES58 = 67 | CES83 = 82 |
| CES09 = 29 | CES34 = 62 | CES59 = 87 | CES84 = 87 |
| CES10 = 72 | CES35 = 79 | CES60 = 91 | CES85 = 84 |
| CES11 = 56 | CES36 = 90 | CES61 = 87 | CES86 = 74 |
| CES12 = 61 | CES37 = 72 | CES62 = 79 | CES87 = 75 |
| CES13 = 41 | CES38 = 66 | CES63 = 72 | CES88 = 76 |
| CES14 = 74 | CES39 = 91 | CES64 = 70 | CES89 = 74 |
| CES15 = 70 | CES40 = 83 | CES65 = 63 | CES90 = 73 |
| CES16 = 46 | CES41 = 83 | CES66 = 64 | CES91 = 92 |
| CES17 = 49 | CES42 = 70 | CES67 = 62 | CES92 = 67 |
| CES18 = 55 | CES43 = 68 | CES68 = 69 | CES93 = 81 |
| CES19 = 71 | CES44 = 98 | CES69 = 80 | CES94 = 56 |
| CES20 = 64 | CES45 = 78 | CES70 = 56 | CES95 = 71 |
| CES21 = 85 | CES46 = 77 | CES71 = 53 | CES96 = 77 |
| CES22 = 77 | CES47 = 73 | CES72 = 84 | CES97 = 82 |
| CES23 = 91 | CES48 = 65 | CES73 = 46 | CES98 = 71 |
| CES24 = 90 | CES49 = 76 | CES74 = 94 | CES99 = 59 |
| CES25 = 71 | CES50 = 85 | CES75 = 49 |            |



Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)