

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: McGRAW-EDISON

Report Number: P1048290

Luminaire Tested: **GALN-SA5B-722-U-T4BC**

Issue Date: 07/10/2025

**Test Information**

Test Method: LM-79-08  
Report Number: P1048290  
Test Lab: INNOVATION CENTER(G3)  
Issue Date: 07/10/2025  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: MCGRAW-EDISON  
Catalog Number: GALN-SA5B-722-U-T4BC  
Description: GALLEON II AREA AND ROADWAY LUMINAIRE 800mA 5xLight Square PACKAGE  
70CRI 2200K FIXTURE w/ TYPE IV ANGLED BACKLIGHT CONTROL  
Light Source: (70) 2200K CCT, 70 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 16515.1 lumens  
Efficiency: N/A  
Efficacy: 92.4 lumens/watt  
Luminous Opening: Rectangular (W 1.5' x L: 1' 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

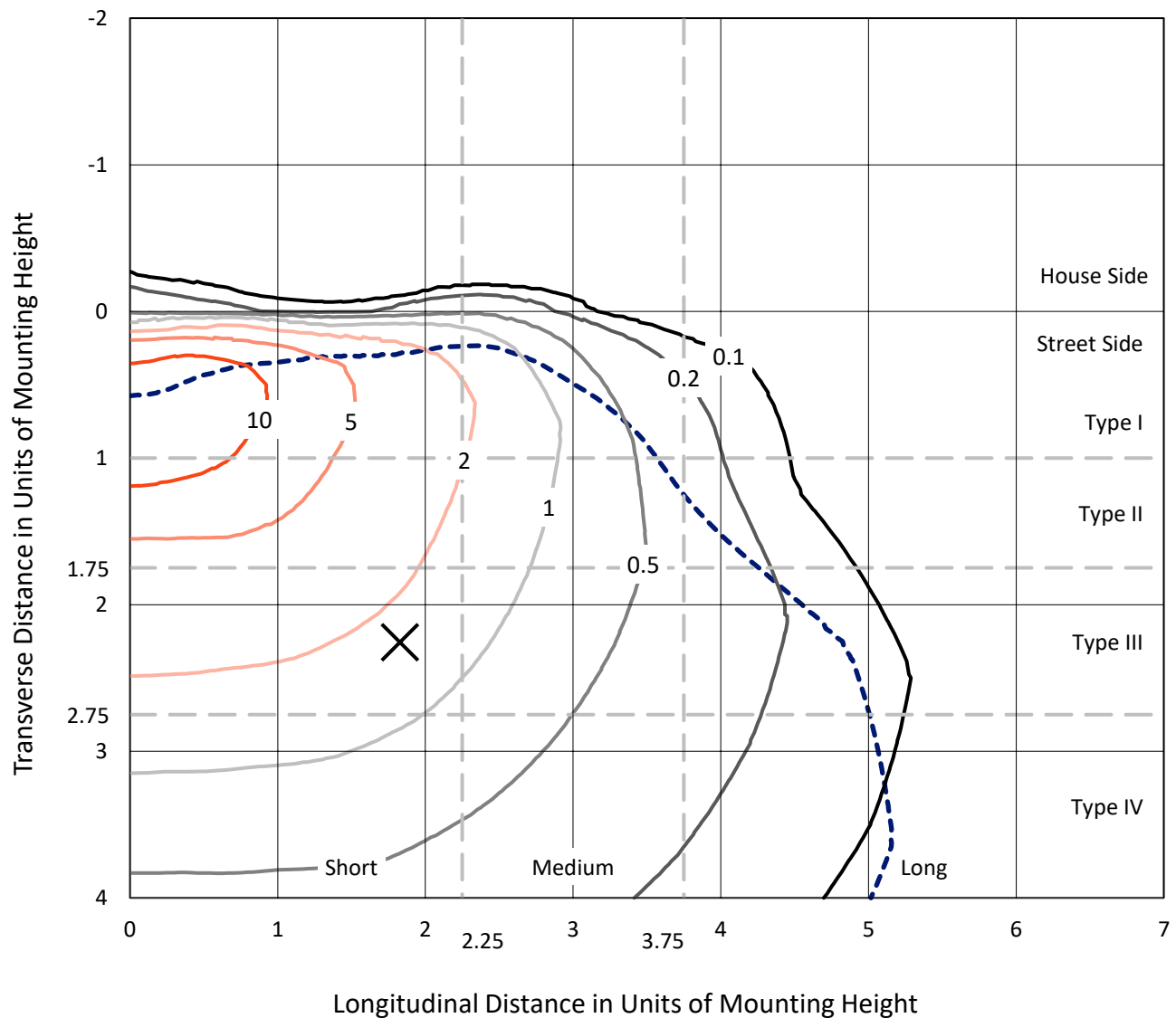


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## Iso-Footcandle Lines of Horizontal Illumination

× Max cd  
 - - - 1/2 Max cd

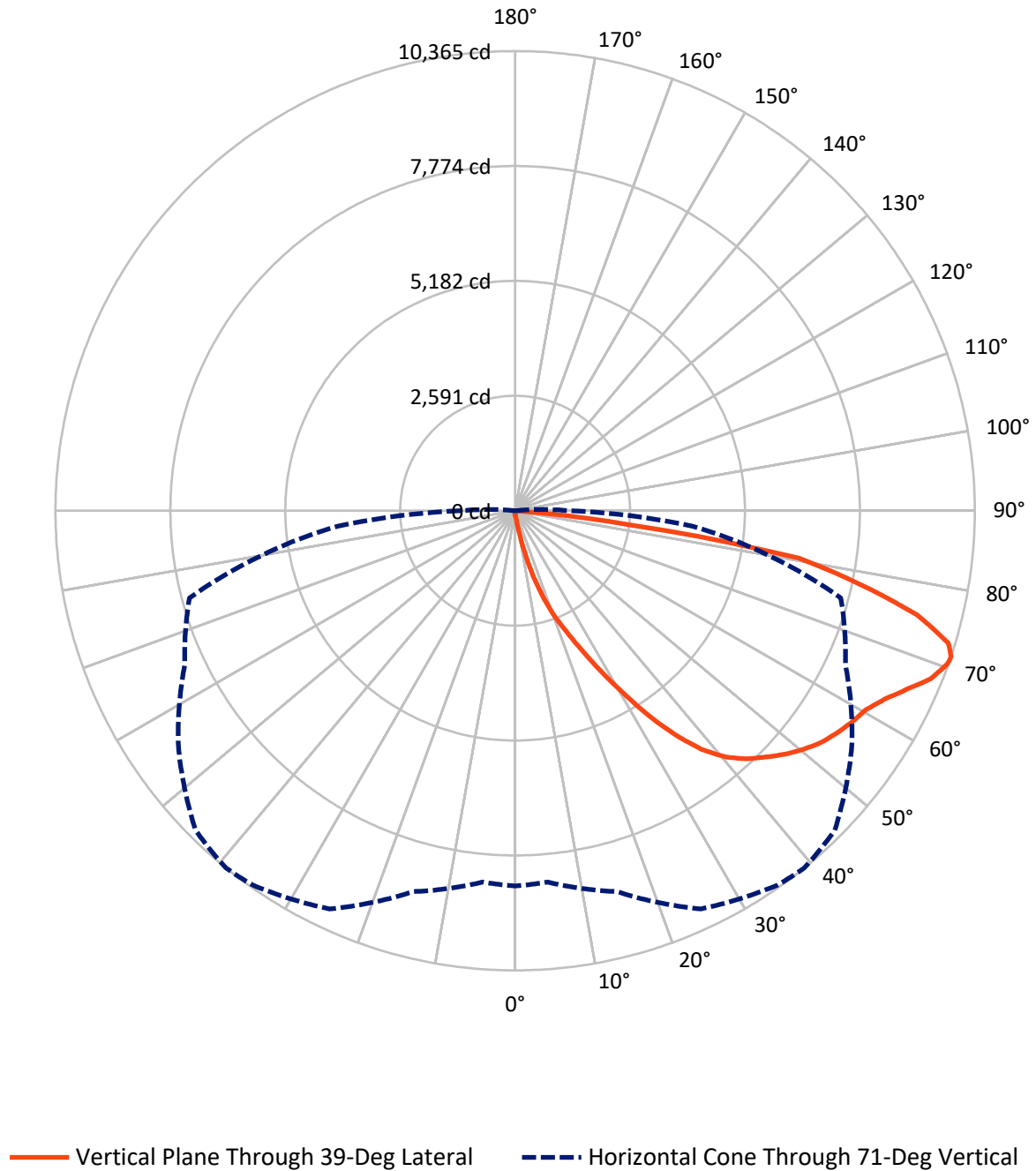


Based on 15 foot mounting height. Maximum calculated value = 17 fc  
 Type IV - Short - N/A

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## Luminous Intensity Polar Plot



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CATALOG NUMBER: GALN-SA5B-722-U-T4BC

**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 58.7     | 0.0    | 58.7    |
|                    | % Fixture | 0.4      | 0.0    | 0.4     |
| <b>Street Side</b> | Lumens    | 16456.4  | 0.0    | 16456.4 |
|                    | % Fixture | 99.6     | 0.0    | 99.6    |
| <b>Total</b>       | Lumens    | 16515.1  | 0.0    | 16515.1 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**Coefficient of Utilization**

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 13.8    | 0.1       |
| 10°-20°   | 176.5   | 1.1       |
| 20°-30°   | 628.6   | 3.8       |
| 30°-40°   | 1515.0  | 9.2       |
| 40°-50°   | 2535.5  | 15.4      |
| 50°-60°   | 3256.5  | 19.7      |
| 60°-70°   | 4121.1  | 25.0      |
| 70°-80°   | 3674.2  | 22.2      |
| 80°-90°   | 593.9   | 3.6       |
| 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°    | 16515.1 | 100.0     |
| 0°-180°   | 16515.1 | 100.0     |



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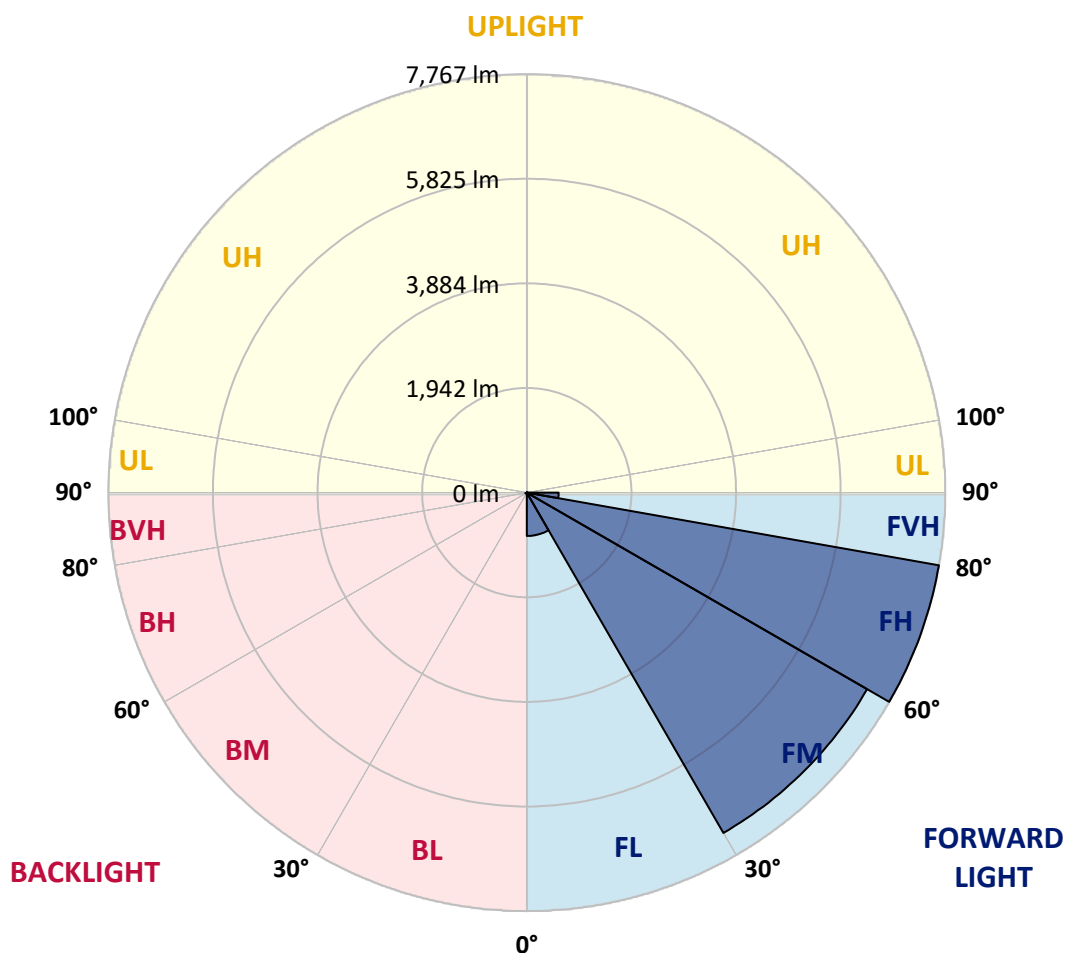
CATALOG NUMBER: GALN-SA5B-722-U-T4BC

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |          |
|------|-------------|--------|-----------|-------------------------|------|----------|
|      |             |        |           | B                       | U    | G        |
| FL   | (0°-30°)    | 804.7  | 4.9       |                         |      |          |
| FM   | (30°-60°)   | 7293.4 | 44.2      |                         |      |          |
| FH   | (60°-80°)   | 7767.1 | 47.0      |                         |      | G4/12000 |
| FVH  | (80°-90°)   | 591.2  | 3.6       |                         |      | G4/750   |
| BL   | (0°-30°)    | 14.2   | 0.1       | B0/110                  |      |          |
| BM   | (30°-60°)   | 13.6   | 0.1       | B0/220                  |      |          |
| BH   | (60°-80°)   | 28.2   | 0.2       | B0/110                  |      | G0/110   |
| BVH  | (80°-90°)   | 2.7    | 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°    | 90.6   | 90.6   | 90.6   | 90.6   | 90.6    | 90.6    | 90.6    | 90.6   | 90.6   | 90.6   | 90.6   |
| 2.5°  | 104.0  | 104.0  | 104.0  | 100.6  | 100.6   | 99.5    | 98.4    | 98.4   | 96.1   | 95.0   | 92.8   |
| 5°    | 157.6  | 154.3  | 146.5  | 142.0  | 133.0   | 127.5   | 121.9   | 114.0  | 106.2  | 100.6  | 93.9   |
| 7.5°  | 356.6  | 364.5  | 338.7  | 290.7  | 241.5   | 220.2   | 184.5   | 148.7  | 123.0  | 106.2  | 95.0   |
| 10°   | 908.9  | 904.5  | 817.2  | 721.1  | 556.8   | 490.8   | 384.6   | 242.6  | 158.8  | 116.3  | 96.1   |
| 12.5° | 1546.2 | 1541.7 | 1438.8 | 1308.0 | 1091.2  | 953.6   | 752.4   | 452.8  | 228.1  | 131.9  | 96.1   |
| 15°   | 2081.7 | 2063.8 | 2031.4 | 1901.7 | 1647.9  | 1532.8  | 1266.7  | 800.5  | 368.9  | 158.8  | 98.4   |
| 17.5° | 2436.1 | 2420.4 | 2390.3 | 2343.3 | 2182.3  | 2045.9  | 1832.4  | 1257.7 | 597.0  | 205.7  | 102.9  |
| 20°   | 2761.4 | 2750.2 | 2725.6 | 2716.7 | 2612.7  | 2540.1  | 2363.4  | 1783.2 | 930.2  | 279.5  | 109.6  |
| 22.5° | 3208.6 | 3185.1 | 3195.2 | 3141.5 | 3039.8  | 2952.6  | 2844.2  | 2333.2 | 1337.1 | 402.5  | 121.9  |
| 25°   | 3756.4 | 3745.3 | 3717.3 | 3679.3 | 3538.4  | 3462.4  | 3295.8  | 2852.0 | 1792.1 | 563.5  | 135.3  |
| 27.5° | 4418.3 | 4406.0 | 4399.3 | 4312.1 | 4150.0  | 4067.2  | 3834.7  | 3341.7 | 2304.2 | 789.3  | 153.2  |
| 30°   | 5180.7 | 5186.3 | 5142.7 | 5030.9 | 4842.0  | 4725.7  | 4486.5  | 3854.8 | 2828.5 | 1054.3 | 172.2  |
| 32.5° | 5970.0 | 5958.9 | 5891.8 | 5759.9 | 5591.0  | 5482.6  | 5178.5  | 4417.2 | 3378.6 | 1404.2 | 194.5  |
| 35°   | 6820.8 | 6799.6 | 6622.9 | 6472.0 | 6327.8  | 6191.4  | 5914.1  | 5070.1 | 3928.6 | 1796.6 | 224.7  |
| 37.5° | 7679.4 | 7579.9 | 7225.5 | 7034.4 | 6934.9  | 6823.1  | 6564.8  | 5766.6 | 4475.3 | 2234.9 | 261.6  |
| 40°   | 8327.9 | 8250.7 | 7830.4 | 7478.2 | 7398.8  | 7303.8  | 7111.5  | 6368.0 | 5056.6 | 2705.5 | 306.3  |
| 42.5° | 8686.7 | 8644.3 | 8266.4 | 7918.7 | 7732.0  | 7648.1  | 7483.8  | 6893.5 | 5631.3 | 3225.4 | 371.2  |
| 45°   | 8839.9 | 8773.9 | 8521.3 | 8359.2 | 8061.8  | 7923.2  | 7727.5  | 7290.4 | 6231.7 | 3815.7 | 461.7  |
| 47.5° | 8793.0 | 8754.9 | 8573.8 | 8633.1 | 8417.3  | 8201.5  | 7914.2  | 7594.5 | 6744.8 | 4493.2 | 585.8  |
| 50°   | 8497.8 | 8465.4 | 8409.5 | 8730.3 | 8703.5  | 8448.6  | 8155.7  | 7834.8 | 7164.1 | 5191.9 | 778.1  |
| 52.5° | 7936.6 | 7923.2 | 8066.3 | 8654.3 | 8865.6  | 8666.6  | 8388.2  | 8047.3 | 7555.3 | 5922.0 | 1053.1 |
| 55°   | 7213.2 | 7268.0 | 7677.2 | 8535.8 | 8948.4  | 8827.6  | 8594.0  | 8246.3 | 7869.5 | 6574.9 | 1459.0 |
| 57.5° | 6915.9 | 6930.4 | 7441.3 | 8452.0 | 8985.2  | 8969.6  | 8794.1  | 8436.3 | 8157.9 | 7097.0 | 2078.3 |
| 60°   | 7263.6 | 7241.2 | 7510.6 | 8515.7 | 9059.0  | 9097.0  | 8971.8  | 8613.0 | 8408.4 | 7545.3 | 2903.4 |
| 62.5° | 7891.9 | 7879.6 | 7965.6 | 8787.4 | 9274.8  | 9351.8  | 9218.9  | 8740.4 | 8629.7 | 7840.4 | 3844.8 |
| 65°   | 8453.1 | 8427.4 | 8587.2 | 9269.2 | 9653.8  | 9708.6  | 9592.3  | 8958.4 | 8727.0 | 8055.1 | 4729.1 |
| 67.5° | 8695.7 | 8690.1 | 8947.2 | 9727.6 | 10051.8 | 10111.1 | 10009.3 | 9259.2 | 8704.6 | 8123.3 | 5119.3 |
| 70°   | 8585.0 | 8563.8 | 8975.2 | 9922.1 | 10276.5 | 10343.6 | 10245.2 | 9371.0 | 8462.0 | 7907.5 | 4541.3 |
| 71°   | 8463.1 | 8406.1 | 8891.3 | 9908.7 | 10307.8 | 10364.8 | 10192.7 | 9269.2 | 8218.3 | 7601.2 | 4016.9 |
| 72.5° | 8085.3 | 8095.3 | 8661.0 | 9769.0 | 10232.9 | 10216.2 | 9895.3  | 8904.8 | 7924.3 | 6905.8 | 3226.5 |
| 75°   | 7155.1 | 7214.4 | 7915.3 | 9182.0 | 9564.4  | 9350.8  | 8860.0  | 8208.2 | 7334.0 | 4951.6 | 2240.4 |
| 77.5° | 5847.1 | 5935.4 | 6705.7 | 8052.8 | 7944.4  | 7923.2  | 7903.0  | 7232.2 | 6263.0 | 2659.7 | 1558.5 |
| 80°   | 2791.6 | 2982.8 | 4044.9 | 5748.7 | 6245.1  | 6485.4  | 6334.5  | 5828.1 | 4843.1 | 1266.7 | 931.3  |
| 82.5° | 182.2  | 180.0  | 254.9  | 483.0  | 2035.9  | 2631.7  | 4181.3  | 4165.6 | 3376.3 | 617.1  | 380.1  |
| 85°   | 86.1   | 88.3   | 97.3   | 110.7  | 128.6   | 140.9   | 194.5   | 1140.3 | 1615.5 | 294.0  | 82.7   |
| 87.5° | 50.3   | 51.4   | 60.4   | 77.1   | 100.6   | 111.8   | 133.0   | 171.1  | 210.2  | 162.1  | 17.9   |
| 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: GALN-SA5B-722-U-T4BC

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°  | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|-------|--------|------|------|------|------|------|------|------|------|------|------|
| 0°    | 90.6   | 90.6 | 90.6 | 90.6 | 90.6 | 90.6 | 90.6 | 90.6 | 90.6 | 90.6 | 90.6 |
| 2.5°  | 91.7   | 90.6 | 87.2 | 83.8 | 80.5 | 78.3 | 77.1 | 78.3 | 78.3 | 79.4 | 79.4 |
| 5°    | 91.7   | 88.3 | 82.7 | 76.0 | 71.6 | 67.1 | 64.8 | 63.7 | 64.8 | 64.8 | 64.8 |
| 7.5°  | 90.6   | 85.0 | 77.1 | 69.3 | 63.7 | 58.1 | 55.9 | 54.8 | 54.8 | 55.9 | 55.9 |
| 10°   | 88.3   | 82.7 | 72.7 | 63.7 | 57.0 | 50.3 | 47.0 | 43.6 | 43.6 | 43.6 | 44.7 |
| 12.5° | 87.2   | 79.4 | 67.1 | 58.1 | 49.2 | 41.4 | 34.7 | 31.3 | 32.4 | 32.4 | 32.4 |
| 15°   | 85.0   | 76.0 | 63.7 | 52.5 | 41.4 | 31.3 | 25.7 | 22.4 | 23.5 | 24.6 | 23.5 |
| 17.5° | 85.0   | 74.9 | 59.3 | 45.8 | 32.4 | 23.5 | 19.0 | 16.8 | 16.8 | 17.9 | 17.9 |
| 20°   | 85.0   | 72.7 | 55.9 | 39.1 | 24.6 | 17.9 | 13.4 | 12.3 | 12.3 | 14.5 | 15.7 |
| 22.5° | 87.2   | 72.7 | 51.4 | 32.4 | 20.1 | 13.4 | 10.1 | 8.9  | 10.1 | 12.3 | 13.4 |
| 25°   | 90.6   | 71.6 | 47.0 | 29.1 | 16.8 | 10.1 | 7.8  | 5.6  | 6.7  | 8.9  | 10.1 |
| 27.5° | 93.9   | 70.4 | 42.5 | 25.7 | 13.4 | 7.8  | 5.6  | 4.5  | 3.4  | 4.5  | 4.5  |
| 30°   | 97.3   | 70.4 | 38.0 | 21.2 | 11.2 | 5.6  | 3.4  | 2.2  | 1.1  | 0.0  | 0.0  |
| 32.5° | 99.5   | 68.2 | 34.7 | 16.8 | 8.9  | 4.5  | 2.2  | 1.1  | 0.0  | 0.0  | 0.0  |
| 35°   | 101.7  | 66.0 | 30.2 | 13.4 | 6.7  | 3.4  | 1.1  | 0.0  | 0.0  | 0.0  | 0.0  |
| 37.5° | 104.0  | 62.6 | 25.7 | 11.2 | 5.6  | 2.2  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 40°   | 106.2  | 58.1 | 21.2 | 10.1 | 3.4  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 42.5° | 108.4  | 54.8 | 17.9 | 7.8  | 2.2  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 45°   | 114.0  | 52.5 | 14.5 | 6.7  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 47.5° | 124.1  | 50.3 | 13.4 | 4.5  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 50°   | 138.6  | 48.1 | 12.3 | 3.4  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 52.5° | 158.8  | 47.0 | 11.2 | 2.2  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 55°   | 194.5  | 45.8 | 10.1 | 2.2  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 57.5° | 256.0  | 44.7 | 10.1 | 2.2  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 60°   | 392.4  | 42.5 | 10.1 | 2.2  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 62.5° | 701.0  | 41.4 | 8.9  | 2.2  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 65°   | 1222.0 | 42.5 | 8.9  | 2.2  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 67.5° | 1751.9 | 44.7 | 7.8  | 3.4  | 1.1  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 70°   | 1499.2 | 39.1 | 7.8  | 4.5  | 2.2  | 1.1  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 71°   | 1222.0 | 34.7 | 7.8  | 4.5  | 2.2  | 1.1  | 1.1  | 0.0  | 0.0  | 0.0  | 0.0  |
| 72.5° | 785.9  | 26.8 | 6.7  | 4.5  | 2.2  | 2.2  | 1.1  | 0.0  | 0.0  | 0.0  | 0.0  |
| 75°   | 332.0  | 22.4 | 6.7  | 4.5  | 3.4  | 2.2  | 2.2  | 1.1  | 0.0  | 0.0  | 0.0  |
| 77.5° | 142.0  | 16.8 | 6.7  | 5.6  | 4.5  | 3.4  | 3.4  | 2.2  | 1.1  | 0.0  | 0.0  |
| 80°   | 53.7   | 13.4 | 7.8  | 6.7  | 5.6  | 5.6  | 4.5  | 2.2  | 1.1  | 0.0  | 0.0  |
| 82.5° | 24.6   | 11.2 | 7.8  | 6.7  | 6.7  | 5.6  | 4.5  | 3.4  | 2.2  | 0.0  | 0.0  |
| 85°   | 15.7   | 10.1 | 7.8  | 6.7  | 6.7  | 5.6  | 5.6  | 3.4  | 2.2  | 0.0  | 0.0  |
| 87.5° | 12.3   | 10.1 | 7.8  | 7.8  | 6.7  | 6.7  | 4.5  | 3.4  | 1.1  | 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: SP1-2407-184-2

Test Date: 10/09/2024

Luminaire Tested: GSS-SB1A-722-U-5WQ

Data in this report applies to families of products including GSS-SB1A-722-U-5WQ

### Test Information

Test Method: LM-79-2019  
 Report Number: SP1-2407-184-2  
 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-722-U-5WQ**  
 Description: GALLEON II SITE SLIM 1SQ 350MA 5WQ HIGH DENSITY LIGHTSQUARE WITH 70 CRI  
 2200K CCT 26 LEDS

### Spectral Parameters

|                           |          |           |      |      |       |
|---------------------------|----------|-----------|------|------|-------|
| CCT (K):                  | 2160     | CRI (Ra): | 71.9 |      |       |
| CIE u':                   | 0.2927   | R1:       | 68.7 | R9:  | -17.8 |
| CIE v':                   | 0.5388   | R2:       | 82.6 | R10: | 60.5  |
| Duv:                      | 0.0015   | R3:       | 95.5 | R11: | 60.2  |
| CIE x:                    | 0.5130   | R4:       | 66.4 | R12: | 48.2  |
| CIE y:                    | 0.4197   | R5:       | 65.4 | R13: | 70.7  |
| CIE z:                    | 0.0674   | R6:       | 75.9 | R14: | 96.8  |
| Peak Wavelength (nm):     | 609      | R7:       | 77.2 | R15: | 61.8  |
| Dominant Wavelength (nm): | 587      | R8:       | 43.5 |      |       |
| Purity:                   | 79.96089 |           |      |      |       |
| Rf:                       | 70.6     |           |      |      |       |
| Rg:                       | 97.6     |           |      |      |       |



### Test Conditions

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

REPORT NUMBER: SP1-2407-184-2

| 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: SP1-2407-184-2

### Photopic Flux vs. Wavelength



### Photopic Lumens: NR

| $\lambda$<br>(nm) | Power<br>$\text{W}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) |
|-------------------|-------------------------------|--------------------------------|-------------------|-------------------------------|--------------------------------|-------------------|-------------------------------|--------------------------------|-------------------|-------------------------------|--------------------------------|-------------------|-------------------------------|--------------------------------|
| 360               | 0                             | NR                             | 490               | 27                            | NR                             | 620               | 966                           | NR                             | 750               | 46                            | NR                             | 880               | 1                             | NR                             |
| 365               | 0                             | NR                             | 495               | 42                            | NR                             | 625               | 930                           | NR                             | 755               | 39                            | NR                             | 885               | 1                             | NR                             |
| 370               | 0                             | NR                             | 500               | 67                            | NR                             | 630               | 888                           | NR                             | 760               | 34                            | NR                             | 890               | 1                             | NR                             |
| 375               | 0                             | NR                             | 505               | 101                           | NR                             | 635               | 835                           | NR                             | 765               | 30                            | NR                             | 895               | 1                             | NR                             |
| 380               | 0                             | NR                             | 510               | 139                           | NR                             | 640               | 778                           | NR                             | 770               | 26                            | NR                             | 900               | 1                             | NR                             |
| 385               | 0                             | NR                             | 515               | 183                           | NR                             | 645               | 717                           | NR                             | 775               | 22                            | NR                             | 905               | 1                             | NR                             |
| 390               | 0                             | NR                             | 520               | 224                           | NR                             | 650               | 656                           | NR                             | 780               | 19                            | NR                             | 910               | 1                             | NR                             |
| 395               | 0                             | NR                             | 525               | 262                           | NR                             | 655               | 595                           | NR                             | 785               | 17                            | NR                             | 915               | 1                             | NR                             |
| 400               | 1                             | NR                             | 530               | 299                           | NR                             | 660               | 536                           | NR                             | 790               | 15                            | NR                             | 920               | 1                             | NR                             |
| 405               | 3                             | NR                             | 535               | 332                           | NR                             | 665               | 480                           | NR                             | 795               | 13                            | NR                             | 925               | 1                             | NR                             |
| 410               | 7                             | NR                             | 540               | 365                           | NR                             | 670               | 425                           | NR                             | 800               | 11                            | NR                             | 930               | 1                             | NR                             |
| 415               | 17                            | NR                             | 545               | 400                           | NR                             | 675               | 376                           | NR                             | 805               | 10                            | NR                             | 935               | 0                             | NR                             |
| 420               | 36                            | NR                             | 550               | 437                           | NR                             | 680               | 332                           | NR                             | 810               | 8                             | NR                             | 940               | 0                             | NR                             |
| 425               | 67                            | NR                             | 555               | 479                           | NR                             | 685               | 291                           | NR                             | 815               | 8                             | NR                             | 945               | 0                             | NR                             |
| 430               | 105                           | NR                             | 560               | 525                           | NR                             | 690               | 255                           | NR                             | 820               | 7                             | NR                             | 950               | 0                             | NR                             |
| 435               | 141                           | NR                             | 565               | 579                           | NR                             | 695               | 221                           | NR                             | 825               | 6                             | NR                             | 955               | 0                             | NR                             |
| 440               | 169                           | NR                             | 570               | 639                           | NR                             | 700               | 192                           | NR                             | 830               | 5                             | NR                             | 960               | 0                             | NR                             |
| 445               | 173                           | NR                             | 575               | 703                           | NR                             | 705               | 167                           | NR                             | 835               | 4                             | NR                             | 965               | 0                             | NR                             |
| 450               | 136                           | NR                             | 580               | 769                           | NR                             | 710               | 144                           | NR                             | 840               | 4                             | NR                             | 970               | 0                             | NR                             |
| 455               | 80                            | NR                             | 585               | 832                           | NR                             | 715               | 125                           | NR                             | 845               | 3                             | NR                             | 975               | 0                             | NR                             |
| 460               | 45                            | NR                             | 590               | 890                           | NR                             | 720               | 109                           | NR                             | 850               | 3                             | NR                             | 980               | 0                             | NR                             |
| 465               | 32                            | NR                             | 595               | 937                           | NR                             | 725               | 94                            | NR                             | 855               | 3                             | NR                             | 985               | 0                             | NR                             |
| 470               | 23                            | NR                             | 600               | 972                           | NR                             | 730               | 81                            | NR                             | 860               | 2                             | NR                             | 990               | 0                             | NR                             |
| 475               | 18                            | NR                             | 605               | 992                           | NR                             | 735               | 70                            | NR                             | 865               | 2                             | NR                             | 995               | 0                             | NR                             |
| 480               | 18                            | NR                             | 610               | 998                           | NR                             | 740               | 61                            | NR                             | 870               | 2                             | NR                             | 1000              | 0                             | NR                             |
| 485               | 20                            | NR                             | 615               | 990                           | NR                             | 745               | 53                            | NR                             | 875               | 2                             | NR                             |                   |                               |                                |

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### Scotopic Flux vs. Wavelength



Scotopic Lumens: NR

S/P: 0.8

| $\lambda$<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               | 27                                   | NR                             | 620               | 966                                  | NR                             | 750               | 46                                   | NR                             | 880               | 1                                    | NR                             |
| 365               | 0                                    | NR                             | 495               | 42                                   | NR                             | 625               | 930                                  | NR                             | 755               | 39                                   | NR                             | 885               | 1                                    | NR                             |
| 370               | 0                                    | NR                             | 500               | 67                                   | NR                             | 630               | 888                                  | NR                             | 760               | 34                                   | NR                             | 890               | 1                                    | NR                             |
| 375               | 0                                    | NR                             | 505               | 101                                  | NR                             | 635               | 835                                  | NR                             | 765               | 30                                   | NR                             | 895               | 1                                    | NR                             |
| 380               | 0                                    | NR                             | 510               | 139                                  | NR                             | 640               | 778                                  | NR                             | 770               | 26                                   | NR                             | 900               | 1                                    | NR                             |
| 385               | 0                                    | NR                             | 515               | 183                                  | NR                             | 645               | 717                                  | NR                             | 775               | 22                                   | NR                             | 905               | 1                                    | NR                             |
| 390               | 0                                    | NR                             | 520               | 224                                  | NR                             | 650               | 656                                  | NR                             | 780               | 19                                   | NR                             | 910               | 1                                    | NR                             |
| 395               | 0                                    | NR                             | 525               | 262                                  | NR                             | 655               | 595                                  | NR                             | 785               | 17                                   | NR                             | 915               | 1                                    | NR                             |
| 400               | 1                                    | NR                             | 530               | 299                                  | NR                             | 660               | 536                                  | NR                             | 790               | 15                                   | NR                             | 920               | 1                                    | NR                             |
| 405               | 3                                    | NR                             | 535               | 332                                  | NR                             | 665               | 480                                  | NR                             | 795               | 13                                   | NR                             | 925               | 1                                    | NR                             |
| 410               | 7                                    | NR                             | 540               | 365                                  | NR                             | 670               | 425                                  | NR                             | 800               | 11                                   | NR                             | 930               | 1                                    | NR                             |
| 415               | 17                                   | NR                             | 545               | 400                                  | NR                             | 675               | 376                                  | NR                             | 805               | 10                                   | NR                             | 935               | 0                                    | NR                             |
| 420               | 36                                   | NR                             | 550               | 437                                  | NR                             | 680               | 332                                  | NR                             | 810               | 8                                    | NR                             | 940               | 0                                    | NR                             |
| 425               | 67                                   | NR                             | 555               | 479                                  | NR                             | 685               | 291                                  | NR                             | 815               | 8                                    | NR                             | 945               | 0                                    | NR                             |
| 430               | 105                                  | NR                             | 560               | 525                                  | NR                             | 690               | 255                                  | NR                             | 820               | 7                                    | NR                             | 950               | 0                                    | NR                             |
| 435               | 141                                  | NR                             | 565               | 579                                  | NR                             | 695               | 221                                  | NR                             | 825               | 6                                    | NR                             | 955               | 0                                    | NR                             |
| 440               | 169                                  | NR                             | 570               | 639                                  | NR                             | 700               | 192                                  | NR                             | 830               | 5                                    | NR                             | 960               | 0                                    | NR                             |
| 445               | 173                                  | NR                             | 575               | 703                                  | NR                             | 705               | 167                                  | NR                             | 835               | 4                                    | NR                             | 965               | 0                                    | NR                             |
| 450               | 136                                  | NR                             | 580               | 769                                  | NR                             | 710               | 144                                  | NR                             | 840               | 4                                    | NR                             | 970               | 0                                    | NR                             |
| 455               | 80                                   | NR                             | 585               | 832                                  | NR                             | 715               | 125                                  | NR                             | 845               | 3                                    | NR                             | 975               | 0                                    | NR                             |
| 460               | 45                                   | NR                             | 590               | 890                                  | NR                             | 720               | 109                                  | NR                             | 850               | 3                                    | NR                             | 980               | 0                                    | NR                             |
| 465               | 32                                   | NR                             | 595               | 937                                  | NR                             | 725               | 94                                   | NR                             | 855               | 3                                    | NR                             | 985               | 0                                    | NR                             |
| 470               | 23                                   | NR                             | 600               | 972                                  | NR                             | 730               | 81                                   | NR                             | 860               | 2                                    | NR                             | 990               | 0                                    | NR                             |
| 475               | 18                                   | NR                             | 605               | 992                                  | NR                             | 735               | 70                                   | NR                             | 865               | 2                                    | NR                             | 995               | 0                                    | NR                             |
| 480               | 18                                   | NR                             | 610               | 998                                  | NR                             | 740               | 61                                   | NR                             | 870               | 2                                    | NR                             | 1000              | 0                                    | NR                             |
| 485               | 20                                   | NR                             | 615               | 990                                  | NR                             | 745               | 53                                   | NR                             | 875               | 2                                    | NR                             |                   |                                      |                                |

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### Melanopic Flux vs. Wavelength



Melanopic Lumens: NR

M/P: 1.21

| $\lambda$<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               | 27                                     | NR                             | 620               | 966                                    | NR                             | 750               | 46                                     | NR                             | 880               | 1                                      | NR                             |
| 365               | 0                                      | NR                             | 495               | 42                                     | NR                             | 625               | 930                                    | NR                             | 755               | 39                                     | NR                             | 885               | 1                                      | NR                             |
| 370               | 0                                      | NR                             | 500               | 67                                     | NR                             | 630               | 888                                    | NR                             | 760               | 34                                     | NR                             | 890               | 1                                      | NR                             |
| 375               | 0                                      | NR                             | 505               | 101                                    | NR                             | 635               | 835                                    | NR                             | 765               | 30                                     | NR                             | 895               | 1                                      | NR                             |
| 380               | 0                                      | NR                             | 510               | 139                                    | NR                             | 640               | 778                                    | NR                             | 770               | 26                                     | NR                             | 900               | 1                                      | NR                             |
| 385               | 0                                      | NR                             | 515               | 183                                    | NR                             | 645               | 717                                    | NR                             | 775               | 22                                     | NR                             | 905               | 1                                      | NR                             |
| 390               | 0                                      | NR                             | 520               | 224                                    | NR                             | 650               | 656                                    | NR                             | 780               | 19                                     | NR                             | 910               | 1                                      | NR                             |
| 395               | 0                                      | NR                             | 525               | 262                                    | NR                             | 655               | 595                                    | NR                             | 785               | 17                                     | NR                             | 915               | 1                                      | NR                             |
| 400               | 1                                      | NR                             | 530               | 299                                    | NR                             | 660               | 536                                    | NR                             | 790               | 15                                     | NR                             | 920               | 1                                      | NR                             |
| 405               | 3                                      | NR                             | 535               | 332                                    | NR                             | 665               | 480                                    | NR                             | 795               | 13                                     | NR                             | 925               | 1                                      | NR                             |
| 410               | 7                                      | NR                             | 540               | 365                                    | NR                             | 670               | 425                                    | NR                             | 800               | 11                                     | NR                             | 930               | 1                                      | NR                             |
| 415               | 17                                     | NR                             | 545               | 400                                    | NR                             | 675               | 376                                    | NR                             | 805               | 10                                     | NR                             | 935               | 0                                      | NR                             |
| 420               | 36                                     | NR                             | 550               | 437                                    | NR                             | 680               | 332                                    | NR                             | 810               | 8                                      | NR                             | 940               | 0                                      | NR                             |
| 425               | 67                                     | NR                             | 555               | 479                                    | NR                             | 685               | 291                                    | NR                             | 815               | 8                                      | NR                             | 945               | 0                                      | NR                             |
| 430               | 105                                    | NR                             | 560               | 525                                    | NR                             | 690               | 255                                    | NR                             | 820               | 7                                      | NR                             | 950               | 0                                      | NR                             |
| 435               | 141                                    | NR                             | 565               | 579                                    | NR                             | 695               | 221                                    | NR                             | 825               | 6                                      | NR                             | 955               | 0                                      | NR                             |
| 440               | 169                                    | NR                             | 570               | 639                                    | NR                             | 700               | 192                                    | NR                             | 830               | 5                                      | NR                             | 960               | 0                                      | NR                             |
| 445               | 173                                    | NR                             | 575               | 703                                    | NR                             | 705               | 167                                    | NR                             | 835               | 4                                      | NR                             | 965               | 0                                      | NR                             |
| 450               | 136                                    | NR                             | 580               | 769                                    | NR                             | 710               | 144                                    | NR                             | 840               | 4                                      | NR                             | 970               | 0                                      | NR                             |
| 455               | 80                                     | NR                             | 585               | 832                                    | NR                             | 715               | 125                                    | NR                             | 845               | 3                                      | NR                             | 975               | 0                                      | NR                             |
| 460               | 45                                     | NR                             | 590               | 890                                    | NR                             | 720               | 109                                    | NR                             | 850               | 3                                      | NR                             | 980               | 0                                      | NR                             |
| 465               | 32                                     | NR                             | 595               | 937                                    | NR                             | 725               | 94                                     | NR                             | 855               | 3                                      | NR                             | 985               | 0                                      | NR                             |
| 470               | 23                                     | NR                             | 600               | 972                                    | NR                             | 730               | 81                                     | NR                             | 860               | 2                                      | NR                             | 990               | 0                                      | NR                             |
| 475               | 18                                     | NR                             | 605               | 992                                    | NR                             | 735               | 70                                     | NR                             | 865               | 2                                      | NR                             | 995               | 0                                      | NR                             |
| 480               | 18                                     | NR                             | 610               | 998                                    | NR                             | 740               | 61                                     | NR                             | 870               | 2                                      | NR                             | 1000              | 0                                      | NR                             |
| 485               | 20                                     | NR                             | 615               | 990                                    | NR                             | 745               | 53                                     | NR                             | 875               | 2                                      | NR                             |                   |                                        |                                |

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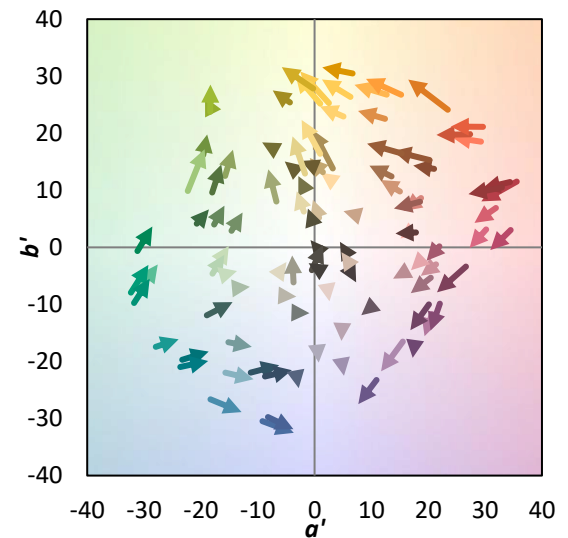
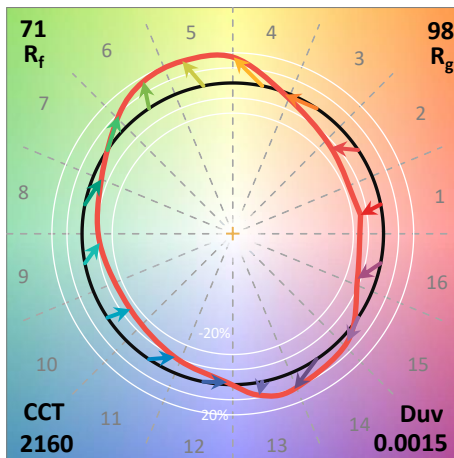
TM-30-18

### Summary

$R_f = 70.6$   
 $R_g = 97.6$   
 $CIE\ R_a = 71.9$   
 $R_g = -17.8$



### Color Vector Graphics

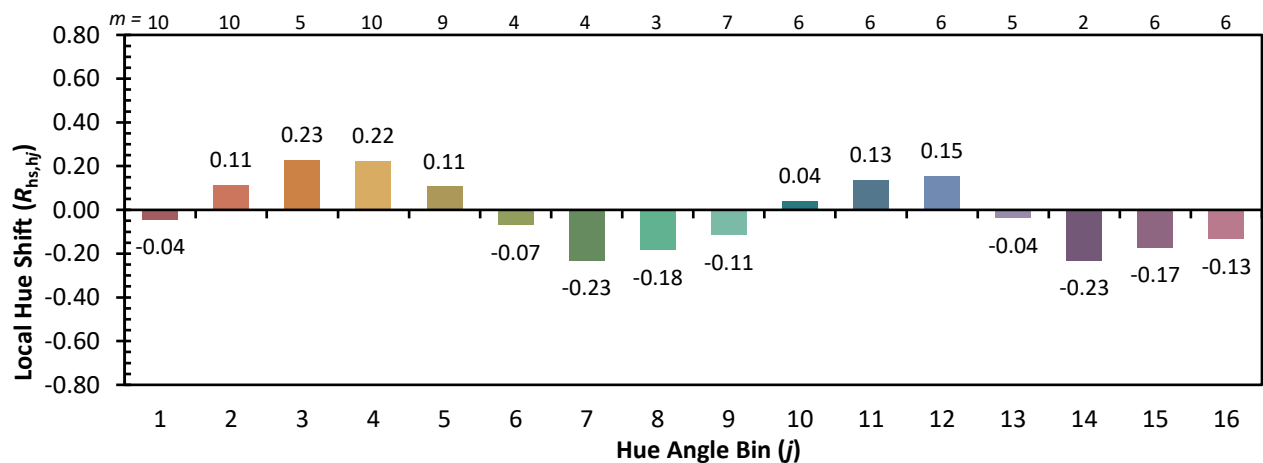
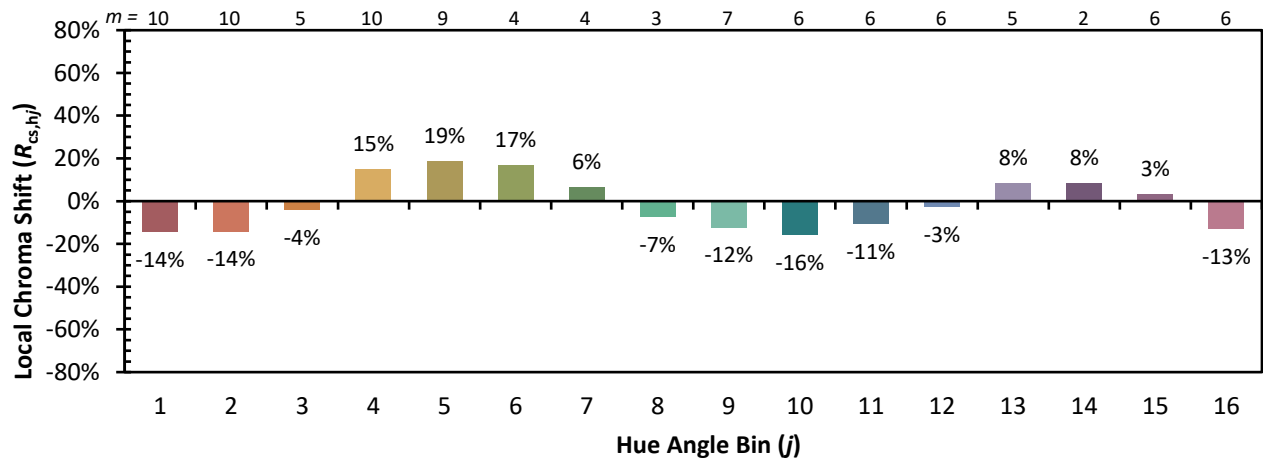


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 87 | CES26 = 60 | CES51 = 74 | CES76 = 58 |
| CES02 = 65 | CES27 = 77 | CES52 = 77 | CES77 = 82 |
| CES03 = 32 | CES28 = 85 | CES53 = 65 | CES78 = 65 |
| CES04 = 72 | CES29 = 50 | CES54 = 77 | CES79 = 86 |
| CES05 = 52 | CES30 = 49 | CES55 = 74 | CES80 = 85 |
| CES06 = 53 | CES31 = 55 | CES56 = 64 | CES81 = 61 |
| CES07 = 44 | CES32 = 55 | CES57 = 60 | CES82 = 93 |
| CES08 = 43 | CES33 = 55 | CES58 = 64 | CES83 = 83 |
| CES09 = 29 | CES34 = 75 | CES59 = 84 | CES84 = 93 |
| CES10 = 79 | CES35 = 88 | CES60 = 89 | CES85 = 81 |
| CES11 = 62 | CES36 = 78 | CES61 = 84 | CES86 = 55 |
| CES12 = 68 | CES37 = 82 | CES62 = 68 | CES87 = 79 |
| CES13 = 45 | CES38 = 54 | CES63 = 68 | CES88 = 72 |
| CES14 = 75 | CES39 = 90 | CES64 = 69 | CES89 = 62 |
| CES15 = 72 | CES40 = 86 | CES65 = 66 | CES90 = 67 |
| CES16 = 49 | CES41 = 75 | CES66 = 64 | CES91 = 89 |
| CES17 = 51 | CES42 = 83 | CES67 = 63 | CES92 = 67 |
| CES18 = 57 | CES43 = 68 | CES68 = 71 | CES93 = 78 |
| CES19 = 74 | CES44 = 98 | CES69 = 81 | CES94 = 52 |
| CES20 = 68 | CES45 = 76 | CES70 = 65 | CES95 = 76 |
| CES21 = 89 | CES46 = 68 | CES71 = 64 | CES96 = 78 |
| CES22 = 81 | CES47 = 60 | CES72 = 88 | CES97 = 76 |
| CES23 = 92 | CES48 = 47 | CES73 = 59 | CES98 = 71 |
| CES24 = 92 | CES49 = 65 | CES74 = 85 | CES99 = 65 |
| CES25 = 74 | CES50 = 74 | CES75 = 66 |            |



### Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)