

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: P1047723

Luminaire Tested: **GALN-SA7C-727-U-T2BC**

Issue Date: 07/10/2025

**Test Information**

Test Method: LM-79-08  
Report Number: P1047723  
Test Lab: INNOVATION CENTER(G3)  
Issue Date: 07/10/2025  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: MCGRAW-EDISON  
Catalog Number: GALN-SA7C-727-U-T2BC  
Description: GALLEON II AREA AND ROADWAY LUMINAIRE 1050mA 7xLight Square PACKAGE  
70CRI 2700K FIXTURE w/ TYPE II ANGLED BACKLIGHT CONTROL  
Light Source: (98) 2700K CCT, 70 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 35046.1 lumens  
Efficiency: N/A  
Efficacy: 106.2 lumens/watt  
Luminous Opening: Rectangular (W 1.5' x L: 1.5' x H: 0')  
IES Classification: Type II - Short  
BUG Rating: B0 - U0 - G5

Input Watts (W): 330  
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

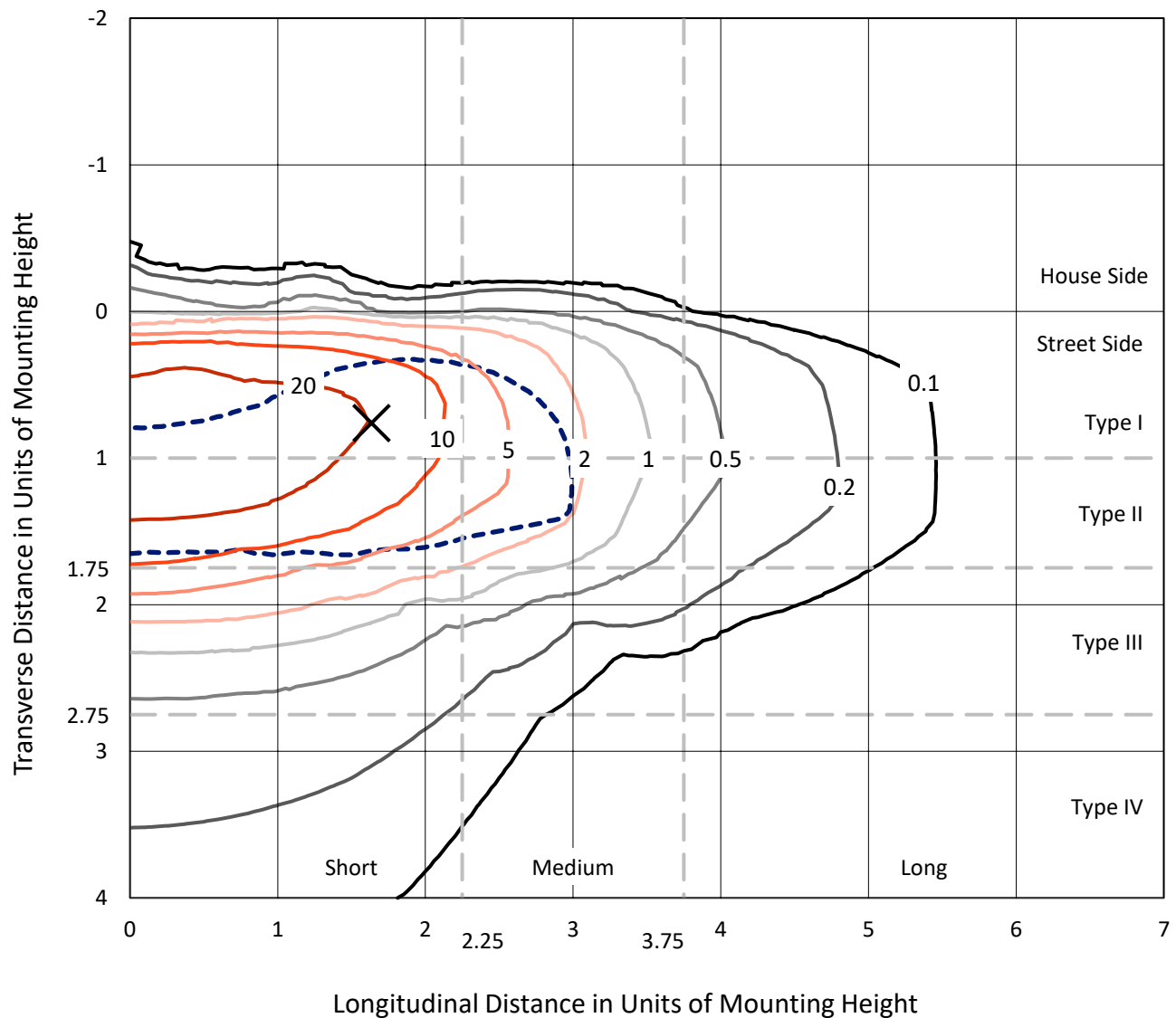


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## Iso-Footcandle Lines of Horizontal Illumination

× Max cd  
 --- 1/2 Max cd

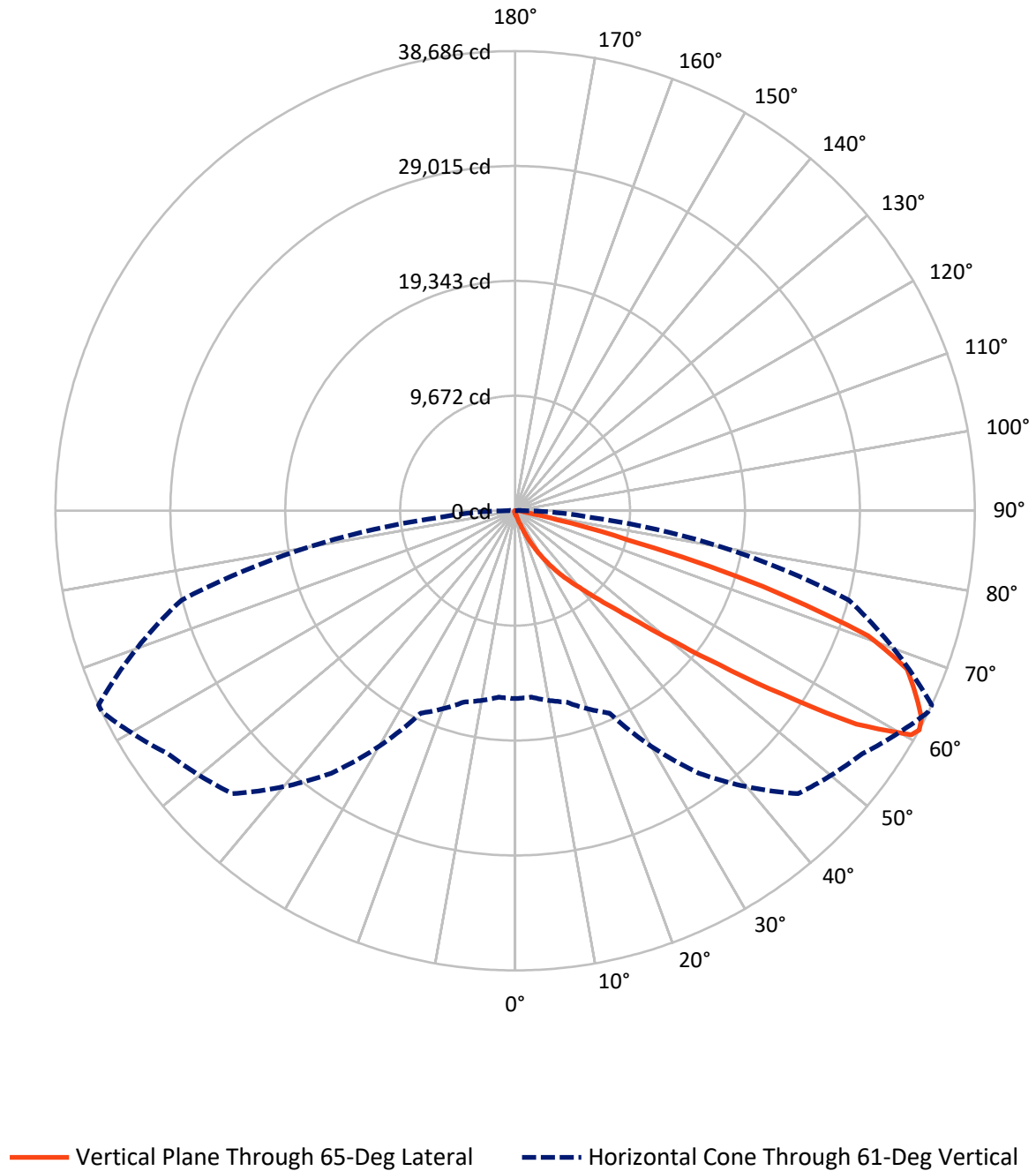


Based on 15 foot mounting height. Maximum calculated value = 46.4 fc  
 Type II - Short - N/A

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CATALOG NUMBER: GALN-SA7C-727-U-T2BC

## Luminous Intensity Polar Plot



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CATALOG NUMBER: GALN-SA7C-727-U-T2BC

**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 149.6    | 0.0    | 149.6   |
|                    | % Fixture | 0.4      | 0.0    | 0.4     |
| <b>Street Side</b> | Lumens    | 34896.5  | 0.0    | 34896.5 |
|                    | % Fixture | 99.6     | 0.0    | 99.6    |
| <b>Total</b>       | Lumens    | 35046.1  | 0.0    | 35046.1 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**Coefficient of Utilization**

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 27.3    | 0.1       |
| 10°-20°   | 288.2   | 0.8       |
| 20°-30°   | 1034.3  | 3.0       |
| 30°-40°   | 2753.6  | 7.9       |
| 40°-50°   | 7233.7  | 20.6      |
| 50°-60°   | 11206.4 | 32.0      |
| 60°-70°   | 9396.4  | 26.8      |
| 70°-80°   | 2765.2  | 7.9       |
| 80°-90°   | 341.1   | 1.0       |
| 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°    | 35046.1 | 100.0     |
| 0°-180°   | 35046.1 | 100.0     |



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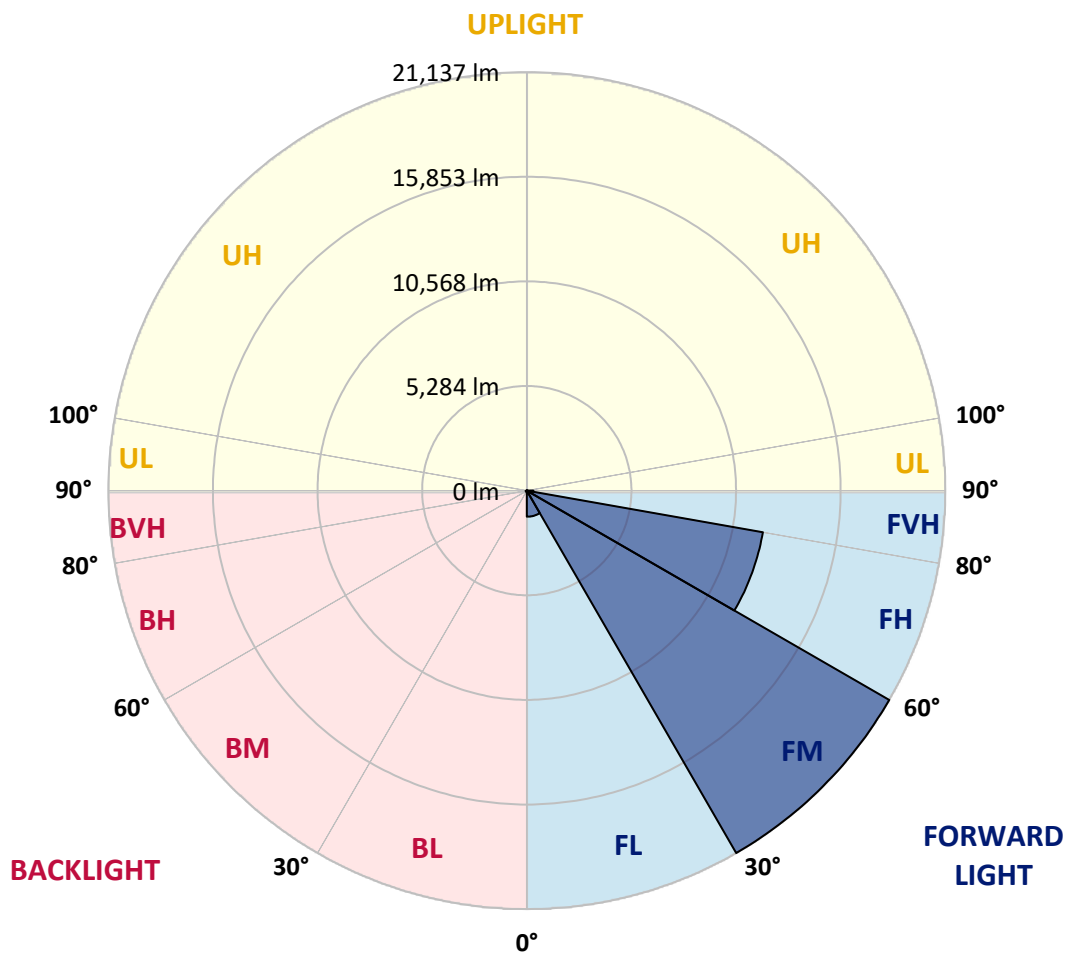
CATALOG NUMBER: GALN-SA7C-727-U-T2BC

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

| Zone |             | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |        |
|------|-------------|---------|-----------|-------------------------|------|--------|
|      |             |         |           | B                       | U    | G      |
| FL   | (0°-30°)    | 1316.2  | 3.8       |                         |      |        |
| FM   | (30°-60°)   | 21136.8 | 60.3      |                         |      |        |
| FH   | (60°-80°)   | 12108.8 | 34.6      |                         |      | G5     |
| FVH  | (80°-90°)   | 334.8   | 1.0       |                         |      | G3/500 |
| BL   | (0°-30°)    | 33.6    | 0.1       | B0/110                  |      |        |
| BM   | (30°-60°)   | 56.9    | 0.2       | B0/220                  |      |        |
| BH   | (60°-80°)   | 52.8    | 0.2       | B0/110                  |      | G0/110 |
| BVH  | (80°-90°)   | 6.3     | 0.0       |                         |      | G0/10  |
| UL   | (90°-100°)  | 0.0     | 0.0       |                         | U0/0 |        |
| UH   | (100°-180°) | 0.0     | 0.0       |                         | U0/0 |        |

**BUG Rating: B0-U0-G5**

Type II Short



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 45°     | 55°     | 64°     | 65°     | 75°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 214.6   | 214.6   | 214.6   | 214.6   | 214.6   | 214.6   | 214.6   | 214.6   | 214.6   | 214.6   | 214.6   |
| 2.5°  | 260.4   | 262.8   | 258.0   | 248.3   | 241.1   | 241.1   | 238.7   | 231.4   | 231.4   | 224.2   | 219.4   |
| 5°    | 364.0   | 359.2   | 349.6   | 330.3   | 313.4   | 296.5   | 279.7   | 262.8   | 260.4   | 238.7   | 224.2   |
| 7.5°  | 595.5   | 600.3   | 568.9   | 508.7   | 458.1   | 393.0   | 332.7   | 296.5   | 291.7   | 255.5   | 226.6   |
| 10°   | 1306.7  | 1270.5  | 1198.2  | 964.3   | 793.2   | 597.9   | 443.6   | 344.7   | 339.9   | 274.8   | 231.4   |
| 12.5° | 2381.9  | 2352.9  | 2220.3  | 1979.3  | 1538.1  | 1070.4  | 648.5   | 426.7   | 412.2   | 291.7   | 233.8   |
| 15°   | 3433.0  | 3387.2  | 3314.8  | 3071.4  | 2555.4  | 1919.0  | 1060.7  | 583.4   | 544.8   | 315.8   | 231.4   |
| 17.5° | 4103.2  | 4110.4  | 4045.3  | 3941.6  | 3609.0  | 2839.9  | 1832.2  | 870.3   | 795.6   | 359.2   | 226.6   |
| 20°   | 4689.0  | 4672.1  | 4708.3  | 4652.8  | 4419.0  | 3859.7  | 2666.3  | 1379.0  | 1251.2  | 429.1   | 229.0   |
| 22.5° | 5364.0  | 5405.0  | 5431.5  | 5419.5  | 5161.5  | 4684.2  | 3613.8  | 2063.6  | 1902.1  | 556.9   | 236.3   |
| 25°   | 6268.1  | 6263.2  | 6265.7  | 6234.3  | 5983.6  | 5453.2  | 4563.6  | 2914.7  | 2750.7  | 764.2   | 253.1   |
| 27.5° | 7215.5  | 7244.4  | 7256.5  | 7143.2  | 6815.3  | 6294.6  | 5443.6  | 3845.2  | 3652.4  | 1096.9  | 274.8   |
| 30°   | 8510.1  | 8486.0  | 8430.5  | 8199.1  | 7801.3  | 7155.2  | 6311.5  | 4821.6  | 4619.1  | 1562.2  | 308.6   |
| 32.5° | 10255.5 | 10229.0 | 9949.4  | 9438.3  | 8842.8  | 8052.1  | 7184.2  | 5800.4  | 5554.5  | 2143.2  | 354.4   |
| 35°   | 13131.6 | 13172.6 | 12485.5 | 11162.0 | 10094.0 | 9129.7  | 8150.9  | 6774.3  | 6557.4  | 2859.2  | 417.1   |
| 37.5° | 17536.1 | 17311.9 | 16378.9 | 14040.5 | 11740.6 | 10474.9 | 9074.2  | 7757.9  | 7569.9  | 3741.6  | 499.0   |
| 40°   | 21815.3 | 21593.5 | 21323.5 | 19108.0 | 14602.2 | 11957.5 | 10366.4 | 8912.7  | 8669.2  | 4737.2  | 619.6   |
| 42.5° | 26313.8 | 26190.9 | 26178.8 | 24508.1 | 19824.0 | 14288.8 | 11921.4 | 10265.2 | 10057.8 | 5829.3  | 817.3   |
| 45°   | 29500.9 | 29377.9 | 29635.9 | 29927.6 | 26935.8 | 19283.9 | 14628.7 | 12022.6 | 11721.3 | 7155.2  | 1133.1  |
| 47.5° | 29930.0 | 29934.8 | 30624.3 | 31538.0 | 32220.3 | 27010.5 | 18235.3 | 14351.5 | 13985.0 | 9052.5  | 1663.4  |
| 50°   | 28502.8 | 28558.3 | 29655.2 | 31289.7 | 33126.7 | 33493.2 | 24594.9 | 17731.4 | 17189.0 | 11301.8 | 2415.6  |
| 52.5° | 25785.9 | 25848.5 | 27377.0 | 30065.0 | 32292.6 | 35050.5 | 32082.9 | 22152.8 | 21528.4 | 14108.0 | 3476.4  |
| 55°   | 23338.9 | 23377.5 | 25130.1 | 28526.9 | 31287.3 | 34204.4 | 36528.4 | 28056.8 | 27237.2 | 17560.2 | 4522.7  |
| 57.5° | 20916.1 | 20826.9 | 21967.2 | 25855.8 | 31116.1 | 33165.3 | 37184.1 | 34785.4 | 33881.3 | 21333.1 | 5337.5  |
| 60°   | 17675.9 | 17526.5 | 18442.6 | 20916.1 | 28864.4 | 33847.6 | 35957.0 | 38507.6 | 38302.7 | 26586.2 | 5966.7  |
| 61°   | 15812.4 | 15749.7 | 16670.6 | 18792.1 | 26969.6 | 33674.0 | 35662.9 | 38664.3 | 38686.0 | 29071.8 | 6248.8  |
| 62.5° | 11292.2 | 11470.6 | 12878.5 | 15636.4 | 22589.1 | 32548.1 | 35701.5 | 38179.8 | 38394.3 | 32374.6 | 6979.3  |
| 65°   | 5019.3  | 5306.2  | 6400.7  | 8645.1  | 13136.4 | 27075.6 | 35359.1 | 37116.6 | 37010.5 | 33281.0 | 9496.1  |
| 67.5° | 2977.3  | 3020.7  | 3565.6  | 4898.7  | 6957.6  | 14563.6 | 31202.9 | 35711.1 | 35568.9 | 28972.9 | 11815.3 |
| 70°   | 2345.7  | 2367.4  | 2541.0  | 3073.8  | 4038.1  | 5578.6  | 17808.5 | 30896.7 | 31516.3 | 23493.2 | 11567.0 |
| 72.5° | 2225.2  | 2220.3  | 2244.5  | 2338.5  | 2543.4  | 2767.6  | 6894.9  | 20537.6 | 21798.4 | 16919.0 | 9698.6  |
| 75°   | 2196.2  | 2186.6  | 2162.5  | 2126.3  | 1841.8  | 1629.7  | 2136.0  | 9083.9  | 9814.3  | 11559.8 | 7302.3  |
| 77.5° | 2131.1  | 2133.6  | 2138.4  | 2039.5  | 1579.1  | 1152.4  | 1034.2  | 2914.7  | 3584.9  | 7336.0  | 5190.4  |
| 80°   | 1441.7  | 1463.4  | 1499.5  | 1460.9  | 1420.0  | 834.1   | 730.5   | 1036.6  | 1051.1  | 4117.6  | 3428.2  |
| 82.5° | 730.5   | 730.5   | 713.6   | 636.4   | 549.7   | 542.4   | 581.0   | 752.2   | 761.8   | 2082.9  | 1612.8  |
| 85°   | 441.2   | 465.3   | 474.9   | 431.5   | 395.4   | 364.0   | 443.6   | 597.9   | 619.6   | 807.6   | 376.1   |
| 87.5° | 98.8    | 101.3   | 110.9   | 147.1   | 214.6   | 291.7   | 412.2   | 547.3   | 556.9   | 518.3   | 45.8    |
| 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-SA7C-727-U-T2BC

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°   | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 214.6  | 214.6 | 214.6 | 214.6 | 214.6 | 214.6 | 214.6 | 214.6 | 214.6 | 214.6 | 214.6 |
| 2.5°  | 217.0  | 212.1 | 209.7 | 202.5 | 195.3 | 188.0 | 183.2 | 180.8 | 183.2 | 185.6 | 185.6 |
| 5°    | 214.6  | 207.3 | 195.3 | 183.2 | 173.6 | 163.9 | 154.3 | 151.9 | 151.9 | 154.3 | 154.3 |
| 7.5°  | 214.6  | 202.5 | 185.6 | 171.2 | 156.7 | 142.2 | 135.0 | 130.2 | 132.6 | 132.6 | 132.6 |
| 10°   | 214.6  | 200.1 | 178.4 | 156.7 | 139.8 | 123.0 | 110.9 | 106.1 | 106.1 | 106.1 | 106.1 |
| 12.5° | 212.1  | 197.7 | 171.2 | 144.6 | 120.5 | 101.3 | 86.8  | 79.6  | 82.0  | 82.0  | 82.0  |
| 15°   | 207.3  | 190.5 | 161.5 | 123.0 | 96.4  | 77.1  | 62.7  | 55.4  | 57.9  | 62.7  | 65.1  |
| 17.5° | 200.1  | 183.2 | 144.6 | 103.7 | 77.1  | 57.9  | 43.4  | 38.6  | 41.0  | 48.2  | 48.2  |
| 20°   | 197.7  | 176.0 | 127.8 | 84.4  | 57.9  | 41.0  | 28.9  | 24.1  | 26.5  | 36.2  | 38.6  |
| 22.5° | 197.7  | 171.2 | 115.7 | 69.9  | 43.4  | 26.5  | 16.9  | 9.6   | 9.6   | 16.9  | 16.9  |
| 25°   | 200.1  | 168.8 | 106.1 | 57.9  | 31.3  | 19.3  | 9.6   | 4.8   | 9.6   | 26.5  | 31.3  |
| 27.5° | 204.9  | 166.3 | 101.3 | 48.2  | 24.1  | 16.9  | 7.2   | 16.9  | 28.9  | 28.9  | 28.9  |
| 30°   | 209.7  | 161.5 | 94.0  | 41.0  | 21.7  | 12.1  | 12.1  | 24.1  | 24.1  | 28.9  | 31.3  |
| 32.5° | 217.0  | 159.1 | 89.2  | 36.2  | 16.9  | 9.6   | 16.9  | 14.5  | 14.5  | 16.9  | 19.3  |
| 35°   | 231.4  | 161.5 | 84.4  | 36.2  | 16.9  | 12.1  | 14.5  | 7.2   | 4.8   | 4.8   | 4.8   |
| 37.5° | 250.7  | 163.9 | 77.1  | 31.3  | 14.5  | 14.5  | 7.2   | 0.0   | 0.0   | 0.0   | 0.0   |
| 40°   | 282.1  | 171.2 | 72.3  | 28.9  | 12.1  | 12.1  | 2.4   | 0.0   | 0.0   | 0.0   | 0.0   |
| 42.5° | 335.1  | 185.6 | 69.9  | 26.5  | 12.1  | 9.6   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 45°   | 441.2  | 219.4 | 65.1  | 24.1  | 12.1  | 4.8   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 47.5° | 634.0  | 298.9 | 62.7  | 19.3  | 7.2   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 50°   | 925.7  | 405.0 | 60.3  | 16.9  | 2.4   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 52.5° | 1181.3 | 426.7 | 41.0  | 14.5  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 55°   | 1210.2 | 294.1 | 31.3  | 9.6   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 57.5° | 964.3  | 190.5 | 26.5  | 7.2   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 60°   | 730.5  | 144.6 | 24.1  | 2.4   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 61°   | 701.5  | 130.2 | 24.1  | 2.4   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 62.5° | 773.9  | 113.3 | 21.7  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 65°   | 1258.4 | 94.0  | 19.3  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 67.5° | 2186.6 | 82.0  | 16.9  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 70°   | 2762.8 | 77.1  | 14.5  | 2.4   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 72.5° | 2408.4 | 69.9  | 14.5  | 4.8   | 2.4   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 75°   | 1448.9 | 60.3  | 14.5  | 9.6   | 4.8   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 77.5° | 759.4  | 45.8  | 14.5  | 12.1  | 7.2   | 2.4   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 80°   | 368.9  | 41.0  | 16.9  | 12.1  | 9.6   | 4.8   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 82.5° | 144.6  | 33.8  | 19.3  | 16.9  | 12.1  | 7.2   | 2.4   | 0.0   | 0.0   | 0.0   | 0.0   |
| 85°   | 65.1   | 28.9  | 21.7  | 19.3  | 16.9  | 9.6   | 2.4   | 0.0   | 0.0   | 0.0   | 0.0   |
| 87.5° | 33.8   | 26.5  | 24.1  | 21.7  | 16.9  | 12.1  | 4.8   | 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: SP1-2407-184-3

Test Date: 10/09/2024

Luminaire Tested: GSS-SB1A-727-U-5WQ

Data in this report applies to families of products including GSS-SB1A-727-U-5WQ

### Test Information

Test Method: LM-79-2019  
 Report Number: SP1-2407-184-3  
 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-727-U-5WQ**  
 Description: GALLEON II SITE SLIM 1SQ 350MA 5WQ HIGH DENSITY LIGHTSQUARE WITH 70 CRI  
 2700K CCT 26 LEDS

### Spectral Parameters

|                           |          |           |      |      |       |
|---------------------------|----------|-----------|------|------|-------|
| CCT (K):                  | 2672     | CRI (Ra): | 71.1 |      |       |
| CIE u':                   | 0.2638   | R1:       | 68.3 | R9:  | -27.8 |
| CIE v':                   | 0.5276   | R2:       | 79.8 | R10: | 54.4  |
| Duv:                      | -0.0002  | R3:       | 91.2 | R11: | 65.8  |
| CIE x:                    | 0.4619   | R4:       | 69.4 | R12: | 45.6  |
| CIE y:                    | 0.4106   | R5:       | 66.5 | R13: | 69.8  |
| CIE z:                    | 0.1275   | R6:       | 72.6 | R14: | 94.5  |
| Peak Wavelength (nm):     | 601      | R7:       | 77.0 | R15: | 60.1  |
| Dominant Wavelength (nm): | 584      | R8:       | 44.1 |      |       |
| Purity:                   | 61.88407 |           |      |      |       |
| Rf:                       | 67.9     |           |      |      |       |
| Rg:                       | 98.6     |           |      |      |       |



### Test Conditions

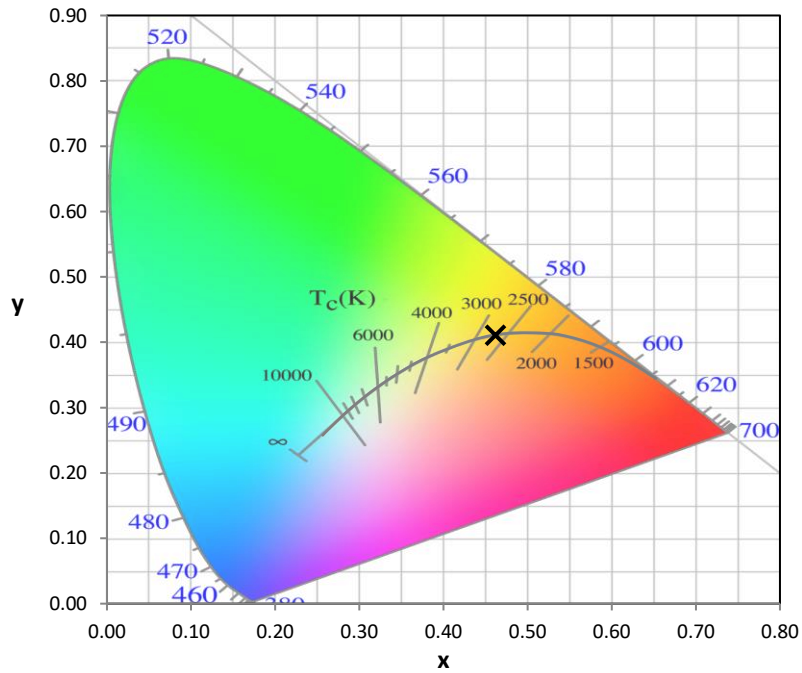
Stabilization Time: 21M  
 Operation Time: 1H 21M  
 Sphere Temperature (°C): 25.2

REPORT NUMBER: SP1-2407-184-3

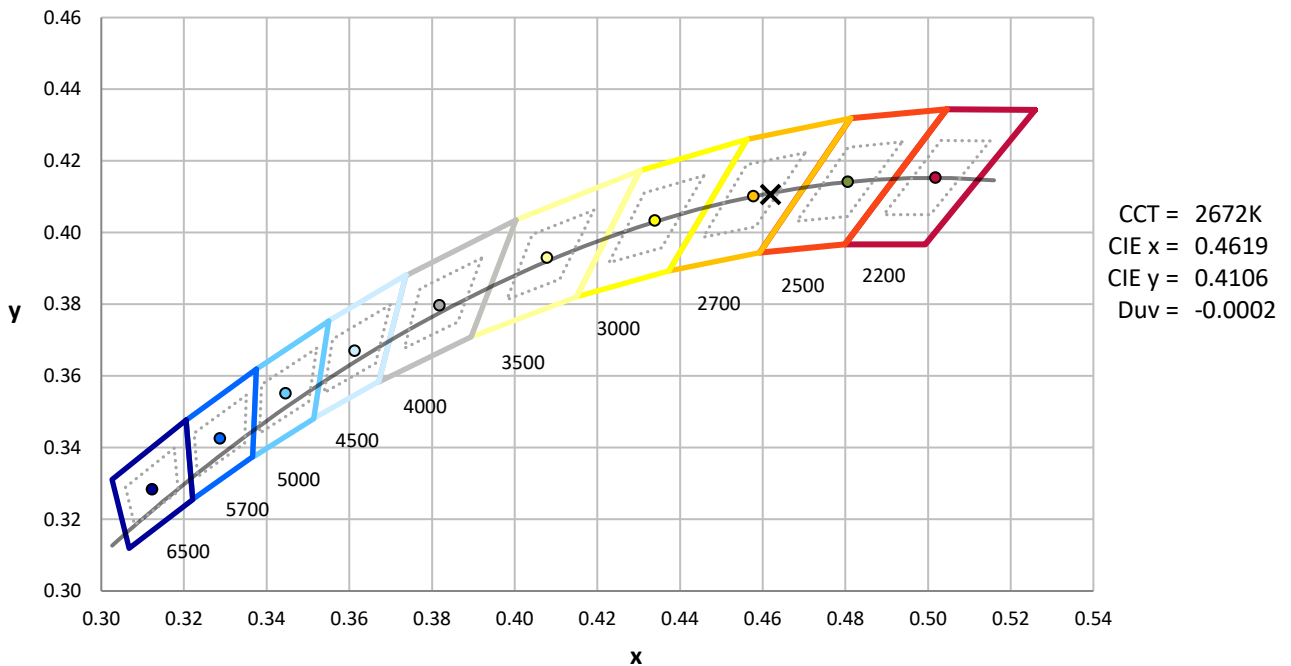
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date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

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**CIE 1931 Chromaticity Diagram**



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



Point lies inside the ANSI 2700K 4-step quadrangle

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### Photopic Flux vs. Wavelength



### Photopic Lumens: NR

| $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) |
|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|
| 360               | 0                                    | NR                             | 490               | 52                                   | NR                             | 620               | 888                                  | NR                             | 750               | 27                                   | NR                             | 880               | 1                                    | NR                             |
| 365               | 0                                    | NR                             | 495               | 87                                   | NR                             | 625               | 834                                  | NR                             | 755               | 23                                   | NR                             | 885               | 1                                    | NR                             |
| 370               | 0                                    | NR                             | 500               | 135                                  | NR                             | 630               | 776                                  | NR                             | 760               | 20                                   | NR                             | 890               | 1                                    | NR                             |
| 375               | 0                                    | NR                             | 505               | 196                                  | NR                             | 635               | 712                                  | NR                             | 765               | 17                                   | NR                             | 895               | 0                                    | NR                             |
| 380               | 0                                    | NR                             | 510               | 258                                  | NR                             | 640               | 648                                  | NR                             | 770               | 15                                   | NR                             | 900               | 0                                    | NR                             |
| 385               | 1                                    | NR                             | 515               | 317                                  | NR                             | 645               | 583                                  | NR                             | 775               | 12                                   | NR                             | 905               | 0                                    | NR                             |
| 390               | 2                                    | NR                             | 520               | 368                                  | NR                             | 650               | 523                                  | NR                             | 780               | 11                                   | NR                             | 910               | 0                                    | NR                             |
| 395               | 4                                    | NR                             | 525               | 408                                  | NR                             | 655               | 465                                  | NR                             | 785               | 9                                    | NR                             | 915               | 0                                    | NR                             |
| 400               | 6                                    | NR                             | 530               | 443                                  | NR                             | 660               | 410                                  | NR                             | 790               | 8                                    | NR                             | 920               | 0                                    | NR                             |
| 405               | 11                                   | NR                             | 535               | 473                                  | NR                             | 665               | 360                                  | NR                             | 795               | 7                                    | NR                             | 925               | 0                                    | NR                             |
| 410               | 23                                   | NR                             | 540               | 498                                  | NR                             | 670               | 313                                  | NR                             | 800               | 6                                    | NR                             | 930               | 0                                    | NR                             |
| 415               | 51                                   | NR                             | 545               | 530                                  | NR                             | 675               | 272                                  | NR                             | 805               | 5                                    | NR                             | 935               | 0                                    | NR                             |
| 420               | 111                                  | NR                             | 550               | 563                                  | NR                             | 680               | 236                                  | NR                             | 810               | 4                                    | NR                             | 940               | 0                                    | NR                             |
| 425               | 214                                  | NR                             | 555               | 605                                  | NR                             | 685               | 203                                  | NR                             | 815               | 4                                    | NR                             | 945               | 0                                    | NR                             |
| 430               | 339                                  | NR                             | 560               | 651                                  | NR                             | 690               | 175                                  | NR                             | 820               | 3                                    | NR                             | 950               | 0                                    | NR                             |
| 435               | 467                                  | NR                             | 565               | 705                                  | NR                             | 695               | 150                                  | NR                             | 825               | 3                                    | NR                             | 955               | 0                                    | NR                             |
| 440               | 535                                  | NR                             | 570               | 765                                  | NR                             | 700               | 128                                  | NR                             | 830               | 3                                    | NR                             | 960               | 0                                    | NR                             |
| 445               | 372                                  | NR                             | 575               | 824                                  | NR                             | 705               | 110                                  | NR                             | 835               | 2                                    | NR                             | 965               | 0                                    | NR                             |
| 450               | 160                                  | NR                             | 580               | 882                                  | NR                             | 710               | 94                                   | NR                             | 840               | 2                                    | NR                             | 970               | 0                                    | NR                             |
| 455               | 89                                   | NR                             | 585               | 930                                  | NR                             | 715               | 80                                   | NR                             | 845               | 2                                    | NR                             | 975               | 0                                    | NR                             |
| 460               | 53                                   | NR                             | 590               | 968                                  | NR                             | 720               | 69                                   | NR                             | 850               | 1                                    | NR                             | 980               | 0                                    | NR                             |
| 465               | 31                                   | NR                             | 595               | 991                                  | NR                             | 725               | 59                                   | NR                             | 855               | 1                                    | NR                             | 985               | 0                                    | NR                             |
| 470               | 23                                   | NR                             | 600               | 999                                  | NR                             | 730               | 50                                   | NR                             | 860               | 1                                    | NR                             | 990               | 0                                    | NR                             |
| 475               | 21                                   | NR                             | 605               | 992                                  | NR                             | 735               | 43                                   | NR                             | 865               | 1                                    | NR                             | 995               | 0                                    | NR                             |
| 480               | 23                                   | NR                             | 610               | 969                                  | NR                             | 740               | 36                                   | NR                             | 870               | 1                                    | NR                             | 1000              | 0                                    | NR                             |
| 485               | 32                                   | NR                             | 615               | 935                                  | NR                             | 745               | 31                                   | NR                             | 875               | 1                                    | NR                             |                   |                                      |                                |

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### Scotopic Flux vs. Wavelength



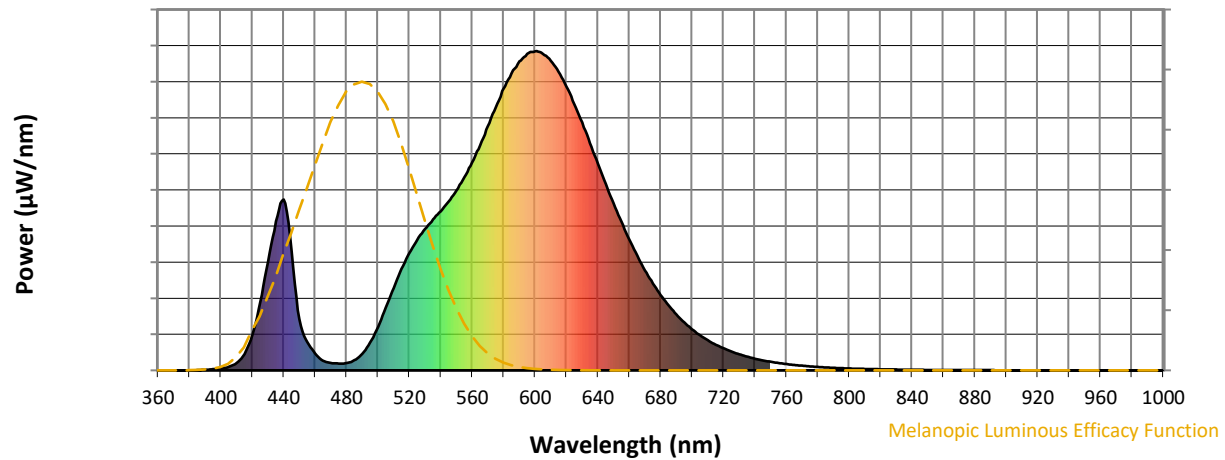
Scotopic Lumens: NR

S/P: 1.02

| 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       | 52                          | NR               | 620       | 888                         | NR               | 750       | 27                          | NR               | 880       | 1                           | NR               |
| 365       | 0                           | NR               | 495       | 87                          | NR               | 625       | 834                         | NR               | 755       | 23                          | NR               | 885       | 1                           | NR               |
| 370       | 0                           | NR               | 500       | 135                         | NR               | 630       | 776                         | NR               | 760       | 20                          | NR               | 890       | 1                           | NR               |
| 375       | 0                           | NR               | 505       | 196                         | NR               | 635       | 712                         | NR               | 765       | 17                          | NR               | 895       | 0                           | NR               |
| 380       | 0                           | NR               | 510       | 258                         | NR               | 640       | 648                         | NR               | 770       | 15                          | NR               | 900       | 0                           | NR               |
| 385       | 1                           | NR               | 515       | 317                         | NR               | 645       | 583                         | NR               | 775       | 12                          | NR               | 905       | 0                           | NR               |
| 390       | 2                           | NR               | 520       | 368                         | NR               | 650       | 523                         | NR               | 780       | 11                          | NR               | 910       | 0                           | NR               |
| 395       | 4                           | NR               | 525       | 408                         | NR               | 655       | 465                         | NR               | 785       | 9                           | NR               | 915       | 0                           | NR               |
| 400       | 6                           | NR               | 530       | 443                         | NR               | 660       | 410                         | NR               | 790       | 8                           | NR               | 920       | 0                           | NR               |
| 405       | 11                          | NR               | 535       | 473                         | NR               | 665       | 360                         | NR               | 795       | 7                           | NR               | 925       | 0                           | NR               |
| 410       | 23                          | NR               | 540       | 498                         | NR               | 670       | 313                         | NR               | 800       | 6                           | NR               | 930       | 0                           | NR               |
| 415       | 51                          | NR               | 545       | 530                         | NR               | 675       | 272                         | NR               | 805       | 5                           | NR               | 935       | 0                           | NR               |
| 420       | 111                         | NR               | 550       | 563                         | NR               | 680       | 236                         | NR               | 810       | 4                           | NR               | 940       | 0                           | NR               |
| 425       | 214                         | NR               | 555       | 605                         | NR               | 685       | 203                         | NR               | 815       | 4                           | NR               | 945       | 0                           | NR               |
| 430       | 339                         | NR               | 560       | 651                         | NR               | 690       | 175                         | NR               | 820       | 3                           | NR               | 950       | 0                           | NR               |
| 435       | 467                         | NR               | 565       | 705                         | NR               | 695       | 150                         | NR               | 825       | 3                           | NR               | 955       | 0                           | NR               |
| 440       | 535                         | NR               | 570       | 765                         | NR               | 700       | 128                         | NR               | 830       | 3                           | NR               | 960       | 0                           | NR               |
| 445       | 372                         | NR               | 575       | 824                         | NR               | 705       | 110                         | NR               | 835       | 2                           | NR               | 965       | 0                           | NR               |
| 450       | 160                         | NR               | 580       | 882                         | NR               | 710       | 94                          | NR               | 840       | 2                           | NR               | 970       | 0                           | NR               |
| 455       | 89                          | NR               | 585       | 930                         | NR               | 715       | 80                          | NR               | 845       | 2                           | NR               | 975       | 0                           | NR               |
| 460       | 53                          | NR               | 590       | 968                         | NR               | 720       | 69                          | NR               | 850       | 1                           | NR               | 980       | 0                           | NR               |
| 465       | 31                          | NR               | 595       | 991                         | NR               | 725       | 59                          | NR               | 855       | 1                           | NR               | 985       | 0                           | NR               |
| 470       | 23                          | NR               | 600       | 999                         | NR               | 730       | 50                          | NR               | 860       | 1                           | NR               | 990       | 0                           | NR               |
| 475       | 21                          | NR               | 605       | 992                         | NR               | 735       | 43                          | NR               | 865       | 1                           | NR               | 995       | 0                           | NR               |
| 480       | 23                          | NR               | 610       | 969                         | NR               | 740       | 36                          | NR               | 870       | 1                           | NR               | 1000      | 0                           | NR               |
| 485       | 32                          | NR               | 615       | 935                         | NR               | 745       | 31                          | NR               | 875       | 1                           | NR               |           |                             |                  |

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### Melanopic Flux vs. Wavelength



Melanopic Lumens: NR

M/P: 1.71

| $\lambda$<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               | 52                                   | NR                             | 620               | 888                                  | NR                             | 750               | 27                                   | NR                             | 880               | 1                                    | NR                             |
| 365               | 0                                    | NR                             | 495               | 87                                   | NR                             | 625               | 834                                  | NR                             | 755               | 23                                   | NR                             | 885               | 1                                    | NR                             |
| 370               | 0                                    | NR                             | 500               | 135                                  | NR                             | 630               | 776                                  | NR                             | 760               | 20                                   | NR                             | 890               | 1                                    | NR                             |
| 375               | 0                                    | NR                             | 505               | 196                                  | NR                             | 635               | 712                                  | NR                             | 765               | 17                                   | NR                             | 895               | 0                                    | NR                             |
| 380               | 0                                    | NR                             | 510               | 258                                  | NR                             | 640               | 648                                  | NR                             | 770               | 15                                   | NR                             | 900               | 0                                    | NR                             |
| 385               | 1                                    | NR                             | 515               | 317                                  | NR                             | 645               | 583                                  | NR                             | 775               | 12                                   | NR                             | 905               | 0                                    | NR                             |
| 390               | 2                                    | NR                             | 520               | 368                                  | NR                             | 650               | 523                                  | NR                             | 780               | 11                                   | NR                             | 910               | 0                                    | NR                             |
| 395               | 4                                    | NR                             | 525               | 408                                  | NR                             | 655               | 465                                  | NR                             | 785               | 9                                    | NR                             | 915               | 0                                    | NR                             |
| 400               | 6                                    | NR                             | 530               | 443                                  | NR                             | 660               | 410                                  | NR                             | 790               | 8                                    | NR                             | 920               | 0                                    | NR                             |
| 405               | 11                                   | NR                             | 535               | 473                                  | NR                             | 665               | 360                                  | NR                             | 795               | 7                                    | NR                             | 925               | 0                                    | NR                             |
| 410               | 23                                   | NR                             | 540               | 498                                  | NR                             | 670               | 313                                  | NR                             | 800               | 6                                    | NR                             | 930               | 0                                    | NR                             |
| 415               | 51                                   | NR                             | 545               | 530                                  | NR                             | 675               | 272                                  | NR                             | 805               | 5                                    | NR                             | 935               | 0                                    | NR                             |
| 420               | 111                                  | NR                             | 550               | 563                                  | NR                             | 680               | 236                                  | NR                             | 810               | 4                                    | NR                             | 940               | 0                                    | NR                             |
| 425               | 214                                  | NR                             | 555               | 605                                  | NR                             | 685               | 203                                  | NR                             | 815               | 4                                    | NR                             | 945               | 0                                    | NR                             |
| 430               | 339                                  | NR                             | 560               | 651                                  | NR                             | 690               | 175                                  | NR                             | 820               | 3                                    | NR                             | 950               | 0                                    | NR                             |
| 435               | 467                                  | NR                             | 565               | 705                                  | NR                             | 695               | 150                                  | NR                             | 825               | 3                                    | NR                             | 955               | 0                                    | NR                             |
| 440               | 535                                  | NR                             | 570               | 765                                  | NR                             | 700               | 128                                  | NR                             | 830               | 3                                    | NR                             | 960               | 0                                    | NR                             |
| 445               | 372                                  | NR                             | 575               | 824                                  | NR                             | 705               | 110                                  | NR                             | 835               | 2                                    | NR                             | 965               | 0                                    | NR                             |
| 450               | 160                                  | NR                             | 580               | 882                                  | NR                             | 710               | 94                                   | NR                             | 840               | 2                                    | NR                             | 970               | 0                                    | NR                             |
| 455               | 89                                   | NR                             | 585               | 930                                  | NR                             | 715               | 80                                   | NR                             | 845               | 2                                    | NR                             | 975               | 0                                    | NR                             |
| 460               | 53                                   | NR                             | 590               | 968                                  | NR                             | 720               | 69                                   | NR                             | 850               | 1                                    | NR                             | 980               | 0                                    | NR                             |
| 465               | 31                                   | NR                             | 595               | 991                                  | NR                             | 725               | 59                                   | NR                             | 855               | 1                                    | NR                             | 985               | 0                                    | NR                             |
| 470               | 23                                   | NR                             | 600               | 999                                  | NR                             | 730               | 50                                   | NR                             | 860               | 1                                    | NR                             | 990               | 0                                    | NR                             |
| 475               | 21                                   | NR                             | 605               | 992                                  | NR                             | 735               | 43                                   | NR                             | 865               | 1                                    | NR                             | 995               | 0                                    | NR                             |
| 480               | 23                                   | NR                             | 610               | 969                                  | NR                             | 740               | 36                                   | NR                             | 870               | 1                                    | NR                             | 1000              | 0                                    | NR                             |
| 485               | 32                                   | NR                             | 615               | 935                                  | NR                             | 745               | 31                                   | NR                             | 875               | 1                                    | NR                             |                   |                                      |                                |

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TM-30-18

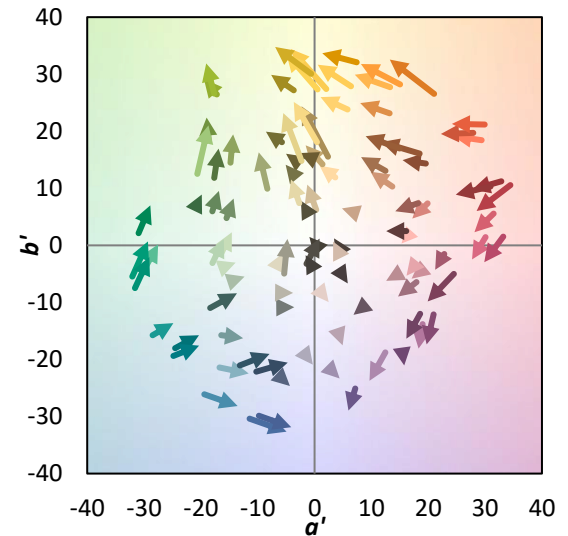
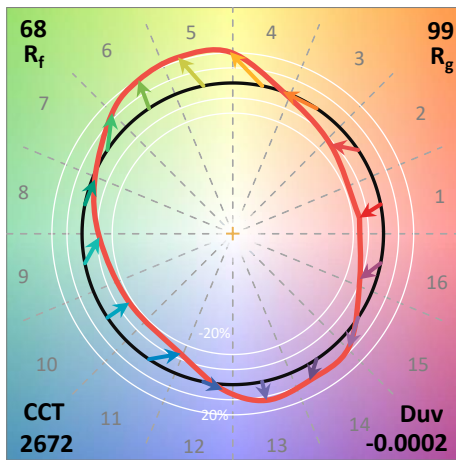
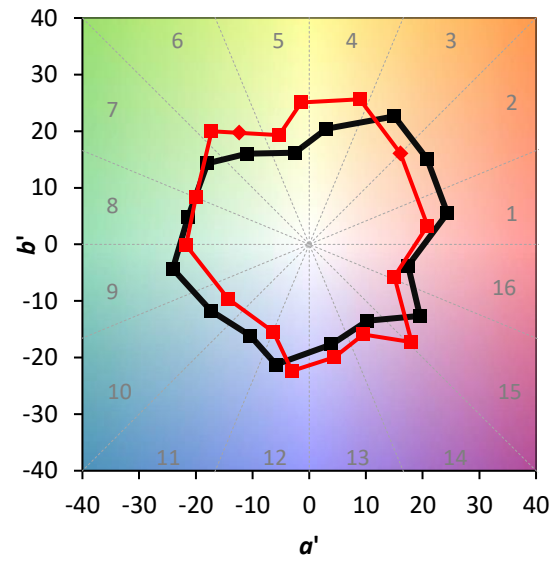
### Summary

$R_f = 67.9$   
 $R_g = 98.6$   
 $CIE R_a = 71.1$   
 $R_g = -27.8$

### Spectral Power Distribution Comparison

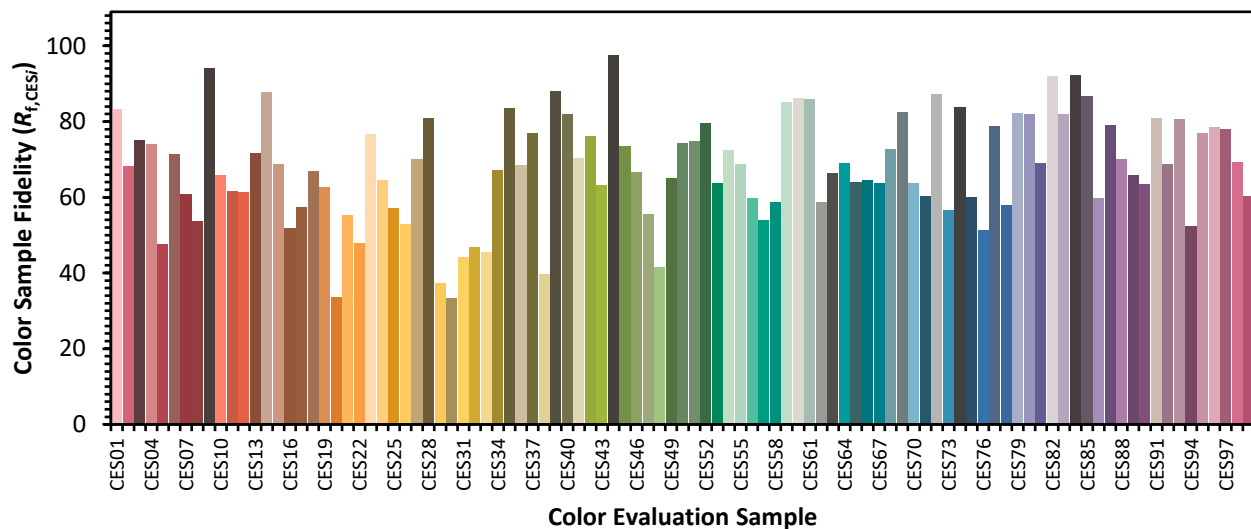


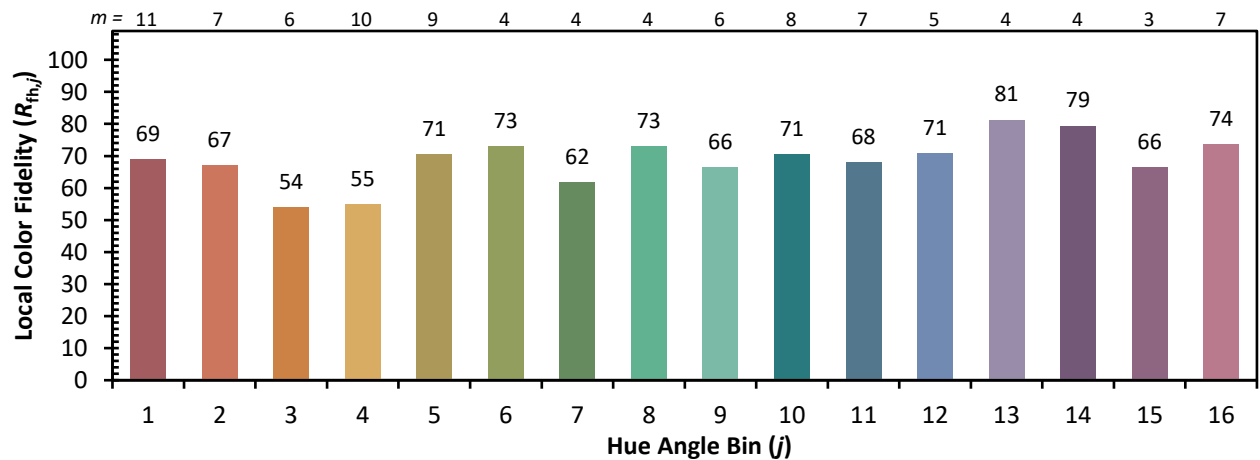
### Color Vector Graphics



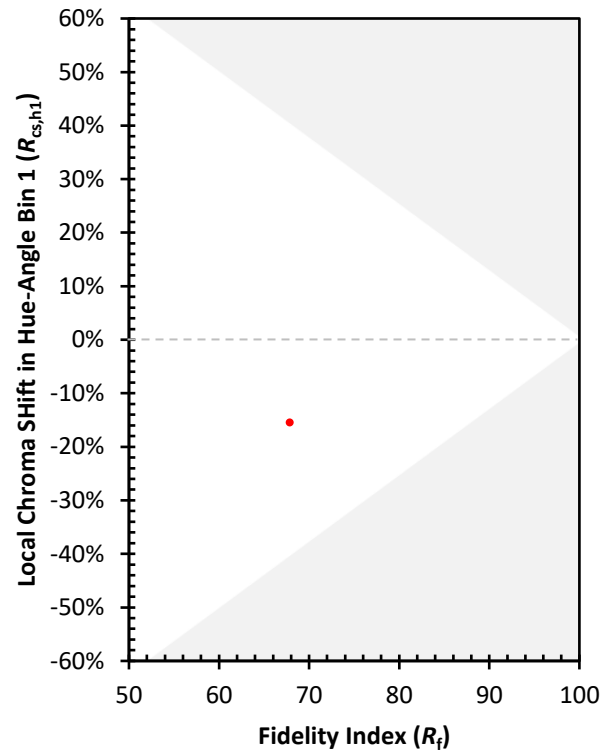
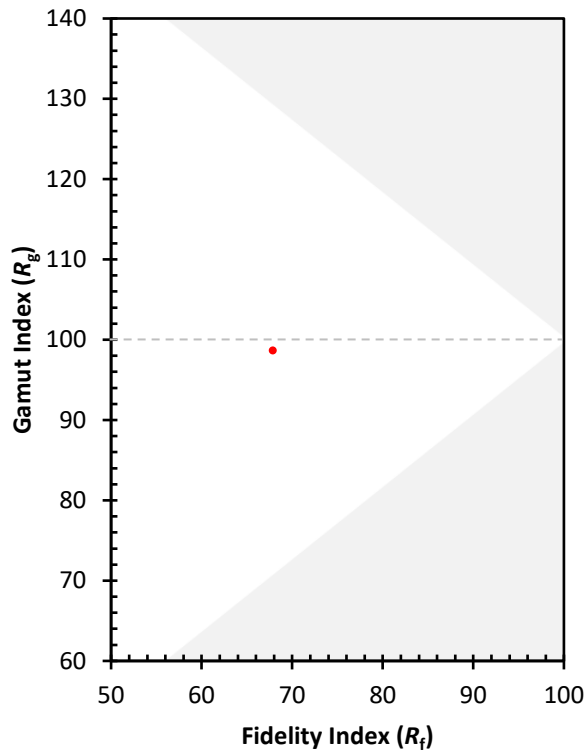
**Individual Sample Fidelity Index ( $R_{f,i}$ )**

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 53 | CES51 = 75 | CES76 = 51 |
| CES02 = 63 | CES27 = 70 | CES52 = 80 | CES77 = 79 |
| CES03 = 31 | CES28 = 81 | CES53 = 64 | CES78 = 58 |
| CES04 = 71 | CES29 = 37 | CES54 = 73 | CES79 = 82 |
| CES05 = 50 | CES30 = 33 | CES55 = 69 | CES80 = 82 |
| CES06 = 52 | CES31 = 44 | CES56 = 60 | CES81 = 69 |
| CES07 = 42 | CES32 = 47 | CES57 = 54 | CES82 = 92 |
| CES08 = 41 | CES33 = 45 | CES58 = 59 | CES83 = 82 |
| CES09 = 29 | CES34 = 67 | CES59 = 85 | CES84 = 92 |
| CES10 = 77 | CES35 = 84 | CES60 = 86 | CES85 = 87 |
| CES11 = 60 | CES36 = 68 | CES61 = 86 | CES86 = 60 |
| CES12 = 66 | CES37 = 77 | CES62 = 59 | CES87 = 79 |
| CES13 = 44 | CES38 = 40 | CES63 = 66 | CES88 = 70 |
| CES14 = 74 | CES39 = 88 | CES64 = 69 | CES89 = 66 |
| CES15 = 72 | CES40 = 82 | CES65 = 64 | CES90 = 64 |
| CES16 = 48 | CES41 = 70 | CES66 = 65 | CES91 = 81 |
| CES17 = 51 | CES42 = 76 | CES67 = 64 | CES92 = 69 |
| CES18 = 57 | CES43 = 63 | CES68 = 73 | CES93 = 81 |
| CES19 = 73 | CES44 = 97 | CES69 = 83 | CES94 = 53 |
| CES20 = 67 | CES45 = 74 | CES70 = 64 | CES95 = 77 |
| CES21 = 88 | CES46 = 67 | CES71 = 60 | CES96 = 79 |
| CES22 = 80 | CES47 = 55 | CES72 = 87 | CES97 = 78 |
| CES23 = 92 | CES48 = 42 | CES73 = 57 | CES98 = 69 |
| CES24 = 92 | CES49 = 65 | CES74 = 84 | CES99 = 60 |
| CES25 = 73 | CES50 = 74 | CES75 = 60 |            |



**Color Rendition by Hue-Angle Bin**


**Measure Comparisons**



(END OF REPORT)