

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: STREETWORKS

Report Number: P1065895

Luminaire Tested: **NVN-SA5C-827-U-T3BC**

Issue Date: 08/07/2025

**Test Information**

Test Method: LM-79-08  
Report Number: P1065895  
Test Lab: INNOVATION CENTER(G3)  
Issue Date: 08/07/2025  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: STREETWORKS  
Catalog Number: NVN-SA5C-827-U-T3BC  
Description: Navion AREA AND ROADWAY LUMINAIRE 1050mA 5xLight Square PACKAGE  
80CRI 2700K FIXTURE w/ TYPE III ANGLED BACKLIGHT CONTROL  
Light Source: (70) 2700K CCT, 80 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 21186.4 lumens  
Efficiency: N/A  
Efficacy: 89.8 lumens/watt  
Luminous Opening: Rectangular (W 1' x L: 1.5' x H: 0')  
IES Classification: Type III - Short  
BUG Rating: B0 - U0 - G4

Input Watts (W): 236  
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

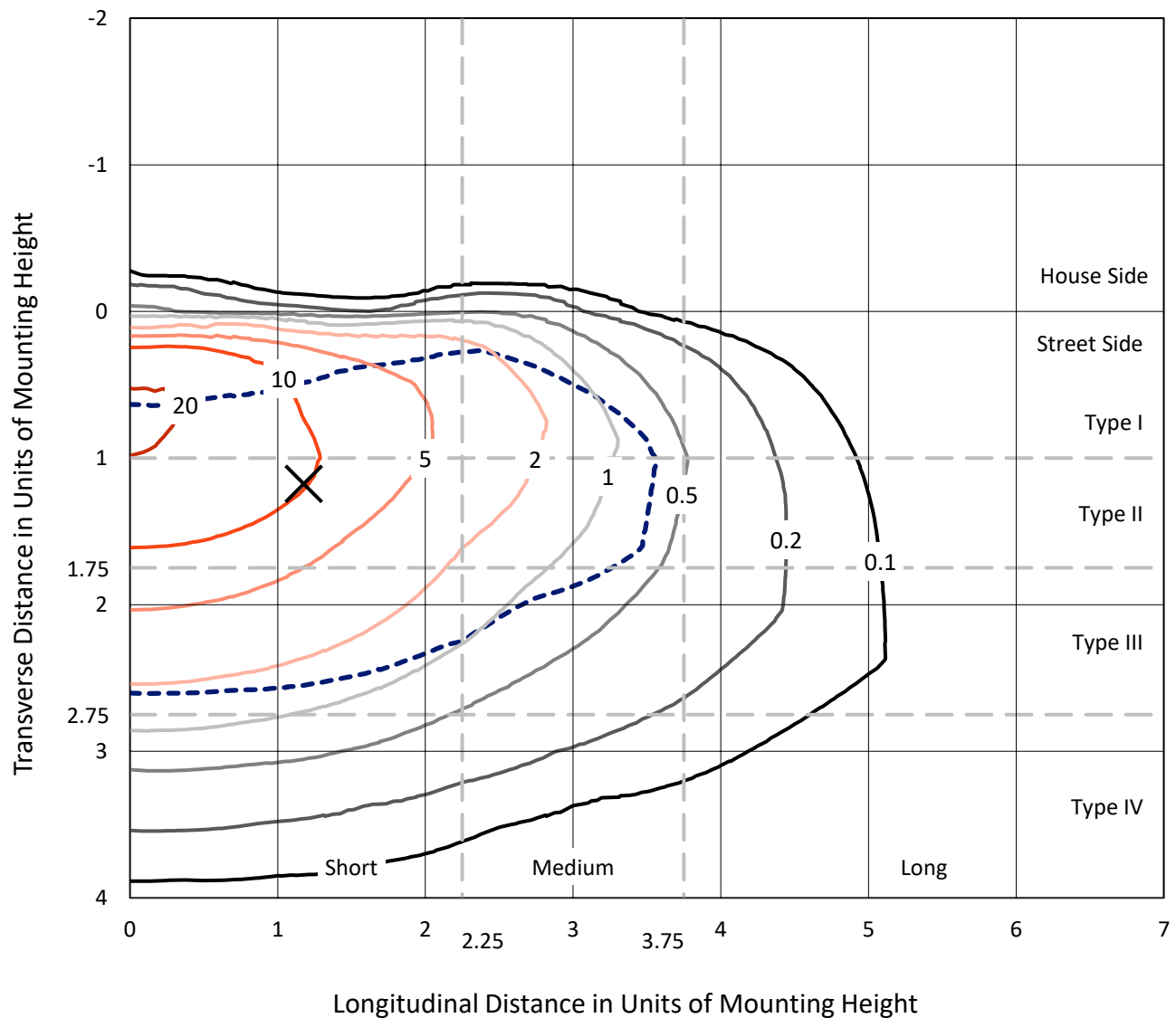


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## Iso-Footcandle Lines of Horizontal Illumination

✕ Max cd  
 - - - 1/2 Max cd

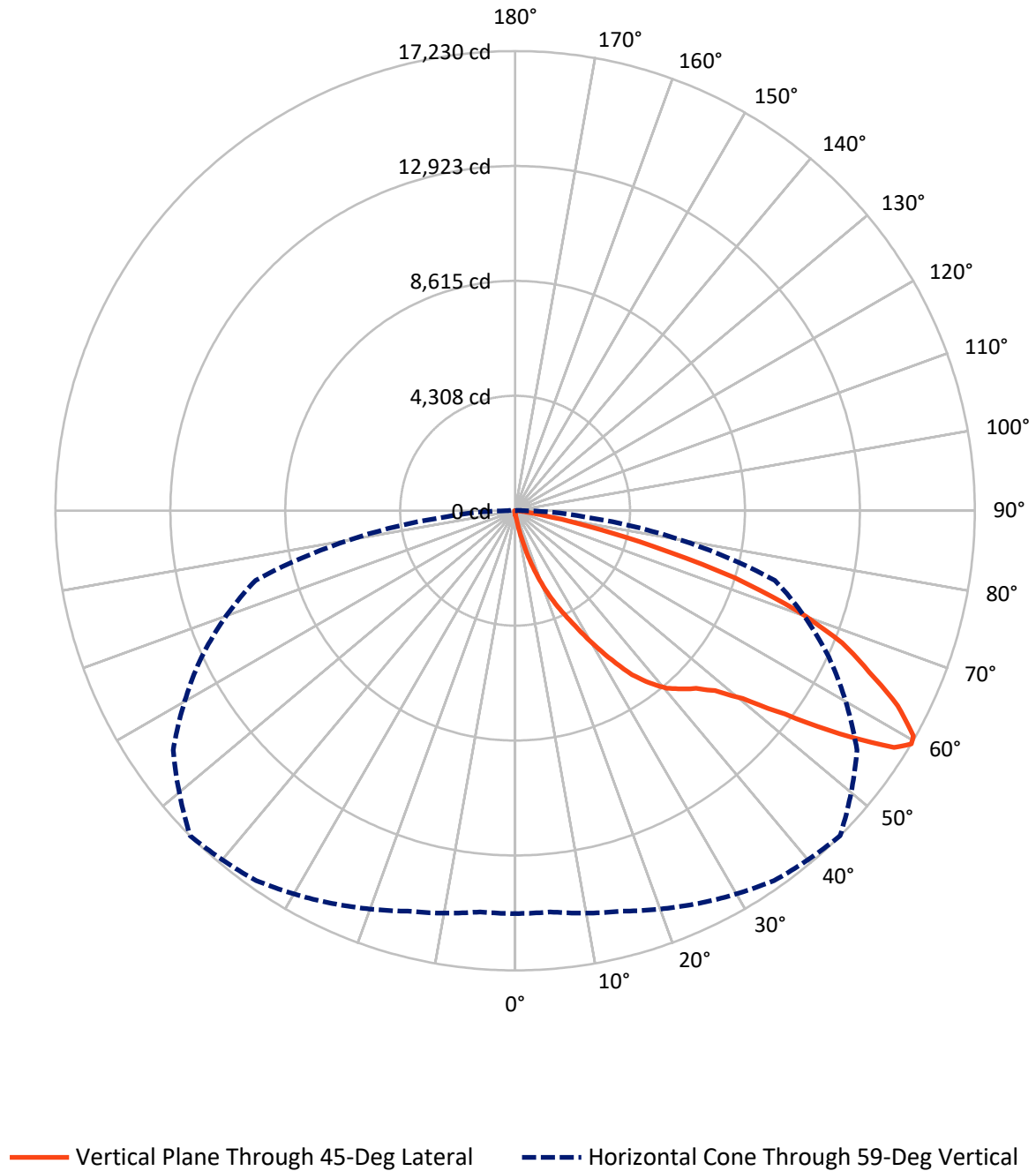


Based on 15 foot mounting height. Maximum calculated value = 23.1 fc  
 Type III - Short - N/A

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CATALOG NUMBER: NVN-SA5C-827-U-T3BC

## Luminous Intensity Polar Plot



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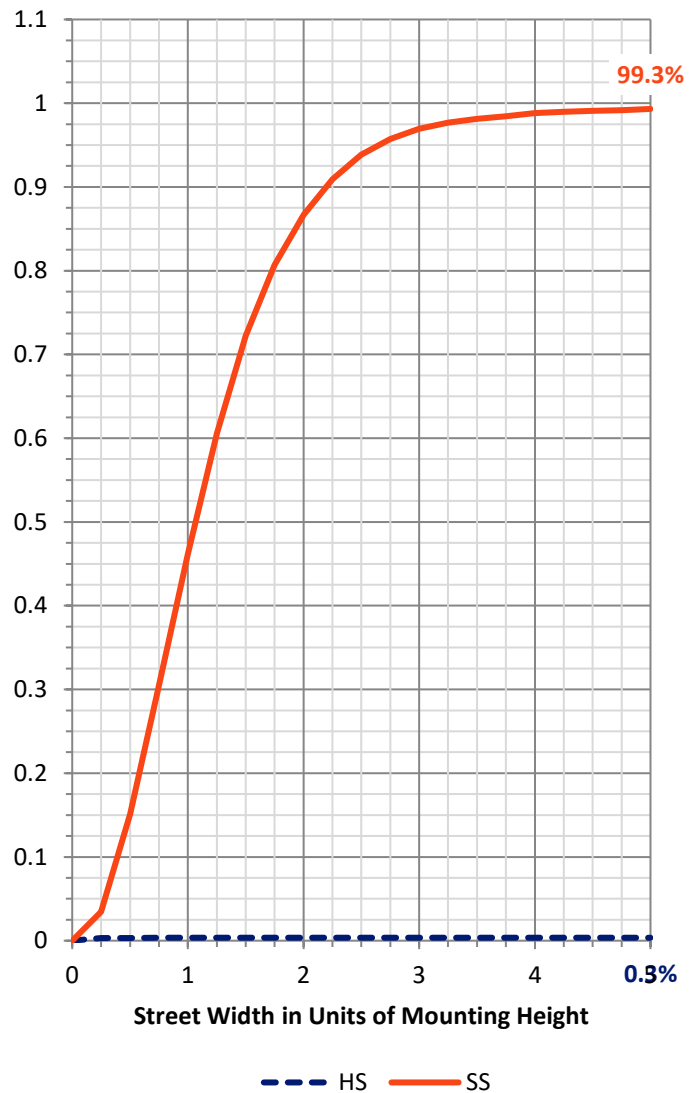
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 75.2     | 0.0    | 75.2    |
|                    | % Fixture | 0.4      | 0.0    | 0.4     |
| <b>Street Side</b> | Lumens    | 21111.2  | 0.0    | 21111.2 |
|                    | % Fixture | 99.6     | 0.0    | 99.6    |
| <b>Total</b>       | Lumens    | 21186.4  | 0.0    | 21186.4 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**Coefficient of Utilization**

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 19.7    | 0.1       |
| 10°-20°   | 234.2   | 1.1       |
| 20°-30°   | 841.4   | 4.0       |
| 30°-40°   | 1955.2  | 9.2       |
| 40°-50°   | 3332.5  | 15.7      |
| 50°-60°   | 5491.1  | 25.9      |
| 60°-70°   | 6348.9  | 30.0      |
| 70°-80°   | 2727.7  | 12.9      |
| 80°-90°   | 235.7   | 1.1       |
| 90°-100°  | 0.0     | 0.0       |
| 100°-110° | 0.0     | 0.0       |
| 110°-120° | 0.0     | 0.0       |
| 120°-130° | 0.0     | 0.0       |
| 130°-140° | 0.0     | 0.0       |
| 140°-150° | 0.0     | 0.0       |
| 150°-160° | 0.0     | 0.0       |
| 160°-170° | 0.0     | 0.0       |
| 170°-180° | 0.0     | 0.0       |
| 0°-90°    | 21186.4 | 100.0     |
| 0°-180°   | 21186.4 | 100.0     |



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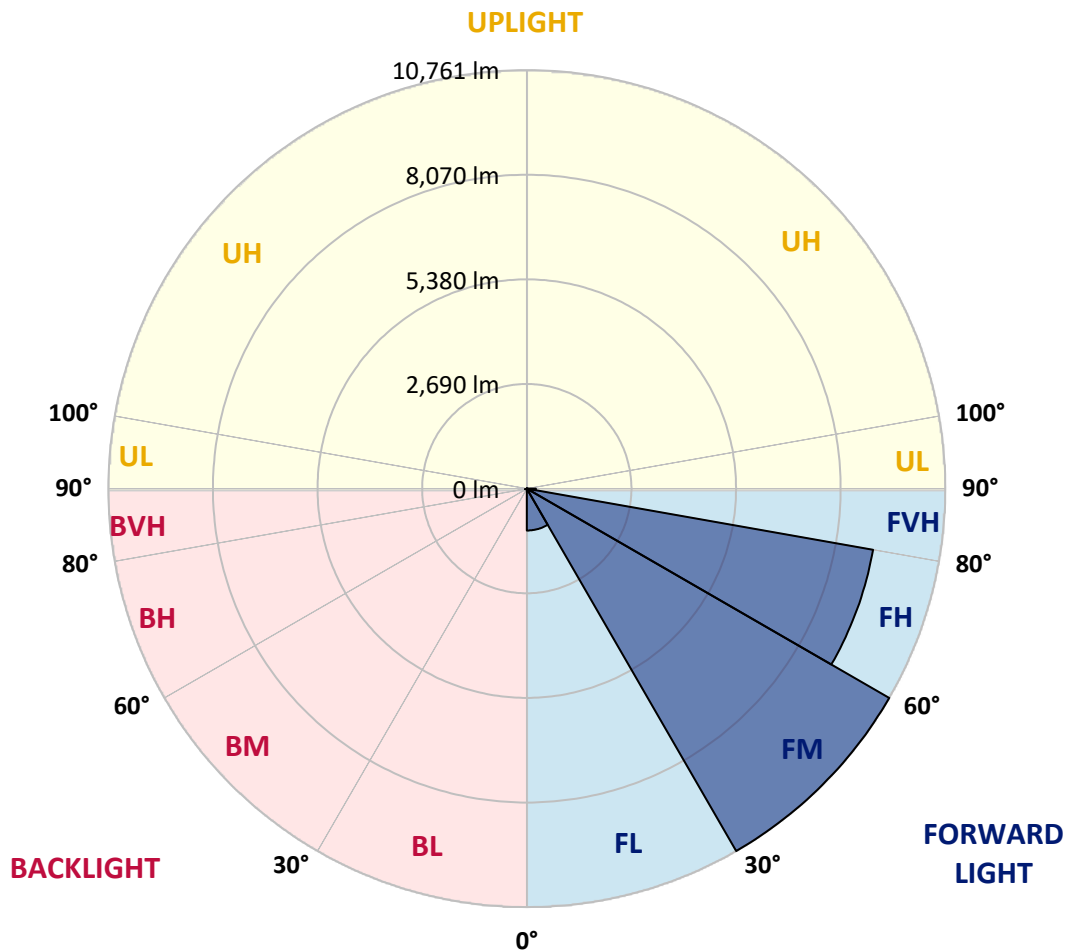
CATALOG NUMBER: NVN-SA5C-827-U-T3BC

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

| Zone |             | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |          |
|------|-------------|---------|-----------|-------------------------|------|----------|
|      |             |         |           | B                       | U    | G        |
| FL   | (0°-30°)    | 1076.7  | 5.1       |                         |      |          |
| FM   | (30°-60°)   | 10760.6 | 50.8      |                         |      |          |
| FH   | (60°-80°)   | 9041.2  | 42.7      |                         |      | G4/12000 |
| FVH  | (80°-90°)   | 232.6   | 1.1       |                         |      | G3/500   |
| BL   | (0°-30°)    | 18.6    | 0.1       | B0/110                  |      |          |
| BM   | (30°-60°)   | 18.2    | 0.1       | B0/220                  |      |          |
| BH   | (60°-80°)   | 35.4    | 0.2       | B0/110                  |      | G0/110   |
| BVH  | (80°-90°)   | 3.1     | 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 III Short





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 44°     | 45°     | 55°     | 65°     | 75°     | 85°    |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--------|
| 0°    | 133.9   | 133.9   | 133.9   | 133.9   | 133.9   | 133.9   | 133.9   | 133.9   | 133.9   | 133.9   | 133.9  |
| 2.5°  | 173.8   | 173.8   | 169.5   | 163.8   | 162.4   | 158.1   | 158.1   | 153.9   | 148.2   | 143.9   | 138.2  |
| 5°    | 252.2   | 250.7   | 239.3   | 225.1   | 206.6   | 195.2   | 195.2   | 179.5   | 165.3   | 152.4   | 141.0  |
| 7.5°  | 551.3   | 538.5   | 497.2   | 428.8   | 339.1   | 279.2   | 274.9   | 223.7   | 189.5   | 163.8   | 142.5  |
| 10°   | 1265.0  | 1220.9  | 1162.5  | 998.6   | 737.9   | 515.7   | 505.7   | 326.2   | 226.5   | 176.6   | 145.3  |
| 12.5° | 2072.8  | 2108.4  | 1991.6  | 1733.7  | 1428.9  | 1062.7  | 991.5   | 549.9   | 299.2   | 193.7   | 148.2  |
| 15°   | 2807.8  | 2799.3  | 2733.8  | 2522.9  | 2171.1  | 1683.9  | 1639.7  | 955.9   | 428.8   | 220.8   | 151.0  |
| 17.5° | 3357.7  | 3347.8  | 3285.1  | 3149.7  | 2879.1  | 2391.9  | 2353.4  | 1524.3  | 672.4   | 259.3   | 153.9  |
| 20°   | 3937.5  | 3924.7  | 3836.4  | 3728.1  | 3491.6  | 3077.1  | 3031.5  | 2159.7  | 1052.8  | 322.0   | 153.9  |
| 22.5° | 4632.7  | 4608.5  | 4514.5  | 4330.7  | 4081.4  | 3721.0  | 3679.7  | 2809.3  | 1524.3  | 424.5   | 161.0  |
| 25°   | 5473.2  | 5431.9  | 5302.3  | 5137.0  | 4836.5  | 4357.8  | 4313.6  | 3533.0  | 2092.7  | 579.8   | 168.1  |
| 27.5° | 6432.0  | 6439.1  | 6263.9  | 5984.7  | 5581.5  | 5092.9  | 5010.3  | 4181.1  | 2681.1  | 802.0   | 176.6  |
| 30°   | 7570.2  | 7499.0  | 7252.5  | 6927.7  | 6536.0  | 5913.4  | 5833.7  | 4826.5  | 3342.1  | 1129.7  | 190.9  |
| 32.5° | 8635.8  | 8558.9  | 8227.0  | 7818.1  | 7397.9  | 6741.1  | 6675.6  | 5551.6  | 3943.2  | 1517.2  | 216.5  |
| 35°   | 9550.4  | 9496.3  | 9031.8  | 8533.2  | 8160.0  | 7573.1  | 7553.1  | 6360.8  | 4649.8  | 1934.6  | 245.0  |
| 37.5° | 10355.3 | 10257.0 | 9660.1  | 9143.0  | 8764.0  | 8238.4  | 8195.6  | 7101.5  | 5330.8  | 2418.9  | 287.8  |
| 40°   | 11041.9 | 10987.8 | 10259.8 | 9580.3  | 9272.6  | 8802.5  | 8748.4  | 7751.1  | 6034.5  | 2981.6  | 340.5  |
| 42.5° | 11777.0 | 11705.8 | 10999.2 | 10237.0 | 9670.1  | 9167.2  | 9131.6  | 8286.8  | 6661.3  | 3599.9  | 418.8  |
| 45°   | 12607.5 | 12475.1 | 11855.4 | 11171.6 | 10309.7 | 9544.7  | 9504.8  | 8764.0  | 7303.8  | 4263.8  | 514.3  |
| 47.5° | 13495.1 | 13379.7 | 12878.2 | 12398.1 | 11406.6 | 10167.2 | 10081.8 | 9170.0  | 7942.0  | 5030.2  | 635.4  |
| 50°   | 14398.2 | 14401.1 | 14025.0 | 13794.2 | 12747.2 | 11178.7 | 11057.6 | 9766.9  | 8613.0  | 5850.8  | 814.9  |
| 52.5° | 15449.6 | 15476.7 | 15471.0 | 15300.0 | 14488.0 | 12832.6 | 12670.2 | 10673.0 | 9392.3  | 6808.1  | 1062.7 |
| 55°   | 15889.8 | 15938.2 | 16253.0 | 16632.0 | 16411.2 | 14929.6 | 14755.8 | 12235.7 | 10425.1 | 7875.1  | 1430.3 |
| 57.5° | 15529.4 | 15583.5 | 16018.0 | 16681.8 | 17189.0 | 16765.9 | 16746.0 | 14270.0 | 11785.6 | 9168.6  | 2031.5 |
| 59°   | 15100.6 | 15093.4 | 15539.3 | 16243.1 | 16926.9 | 17201.8 | 17230.3 | 15646.2 | 12970.8 | 10076.1 | 2550.0 |
| 60°   | 14815.6 | 14821.3 | 15117.7 | 15839.9 | 16566.5 | 17043.7 | 17154.8 | 16456.8 | 13663.2 | 10728.5 | 2994.5 |
| 62.5° | 13715.9 | 13781.4 | 14016.5 | 14687.4 | 15376.9 | 15909.7 | 16099.2 | 17179.0 | 15644.8 | 12269.9 | 4540.1 |
| 65°   | 12520.6 | 12524.9 | 12859.7 | 13433.8 | 14094.8 | 14469.5 | 14589.1 | 16055.0 | 16968.2 | 13839.8 | 6567.3 |
| 67.5° | 10388.0 | 10474.9 | 10855.3 | 11785.6 | 12658.8 | 13133.2 | 13224.4 | 13975.1 | 16419.7 | 14862.7 | 7583.0 |
| 70°   | 7269.6  | 7383.6  | 7926.4  | 9133.0  | 10433.6 | 11212.9 | 11207.2 | 11617.5 | 14451.0 | 14406.8 | 6429.1 |
| 72.5° | 3629.8  | 3826.4  | 4269.5  | 5561.6  | 7137.2  | 8360.9  | 8618.7  | 9345.3  | 11608.9 | 11966.5 | 4796.6 |
| 75°   | 1604.1  | 1615.5  | 1867.6  | 2518.7  | 3547.2  | 5101.4  | 5332.2  | 7417.8  | 8906.5  | 8316.7  | 3464.6 |
| 77.5° | 933.1   | 941.6   | 987.2   | 1131.1  | 1437.4  | 2500.1  | 2759.4  | 4864.9  | 6293.8  | 4833.6  | 2259.4 |
| 80°   | 339.1   | 347.6   | 346.2   | 428.8   | 629.7   | 984.4   | 1096.9  | 2357.7  | 4198.2  | 2545.7  | 1183.8 |
| 82.5° | 208.0   | 208.0   | 200.9   | 202.3   | 229.4   | 377.5   | 413.1   | 1004.3  | 2044.3  | 1253.6  | 339.1  |
| 85°   | 102.6   | 108.3   | 115.4   | 129.6   | 153.9   | 186.6   | 198.0   | 287.8   | 688.1   | 303.4   | 81.2   |
| 87.5° | 61.3    | 62.7    | 68.4    | 82.6    | 102.6   | 133.9   | 142.5   | 195.2   | 246.5   | 203.7   | 19.9   |
| 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: NVN-SA5C-827-U-T3BC

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°   | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 133.9  | 133.9 | 133.9 | 133.9 | 133.9 | 133.9 | 133.9 | 133.9 | 133.9 | 133.9 | 133.9 |
| 2.5°  | 135.3  | 133.9 | 126.8 | 121.1 | 115.4 | 109.7 | 105.4 | 101.1 | 101.1 | 102.6 | 101.1 |
| 5°    | 135.3  | 129.6 | 118.2 | 108.3 | 99.7  | 92.6  | 85.5  | 79.8  | 78.4  | 78.4  | 79.8  |
| 7.5°  | 133.9  | 126.8 | 111.1 | 98.3  | 86.9  | 76.9  | 69.8  | 62.7  | 61.3  | 62.7  | 61.3  |
| 10°   | 132.5  | 123.9 | 105.4 | 89.7  | 74.1  | 64.1  | 54.1  | 47.0  | 47.0  | 47.0  | 48.4  |
| 12.5° | 132.5  | 119.7 | 99.7  | 81.2  | 64.1  | 52.7  | 42.7  | 35.6  | 34.2  | 34.2  | 34.2  |
| 15°   | 131.1  | 116.8 | 94.0  | 71.2  | 54.1  | 39.9  | 31.3  | 24.2  | 24.2  | 24.2  | 24.2  |
| 17.5° | 128.2  | 112.5 | 86.9  | 62.7  | 42.7  | 29.9  | 21.4  | 14.2  | 14.2  | 17.1  | 17.1  |
| 20°   | 125.4  | 108.3 | 78.4  | 51.3  | 35.6  | 22.8  | 14.2  | 8.5   | 8.5   | 12.8  | 14.2  |
| 22.5° | 126.8  | 108.3 | 72.7  | 45.6  | 28.5  | 17.1  | 11.4  | 7.1   | 5.7   | 10.0  | 12.8  |
| 25°   | 128.2  | 105.4 | 65.5  | 39.9  | 21.4  | 12.8  | 8.5   | 2.8   | 1.4   | 2.8   | 4.3   |
| 27.5° | 128.2  | 102.6 | 57.0  | 31.3  | 15.7  | 10.0  | 4.3   | 0.0   | 0.0   | 0.0   | 0.0   |
| 30°   | 126.8  | 98.3  | 49.9  | 25.6  | 11.4  | 5.7   | 1.4   | 0.0   | 0.0   | 0.0   | 0.0   |
| 32.5° | 125.4  | 94.0  | 45.6  | 19.9  | 10.0  | 2.8   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 35°   | 126.8  | 88.3  | 39.9  | 15.7  | 5.7   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 2.8   |
| 37.5° | 131.1  | 82.6  | 34.2  | 12.8  | 4.3   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 40°   | 136.8  | 78.4  | 28.5  | 10.0  | 1.4   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 42.5° | 148.2  | 78.4  | 25.6  | 7.1   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 45°   | 162.4  | 78.4  | 21.4  | 5.7   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 47.5° | 180.9  | 79.8  | 18.5  | 5.7   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 50°   | 203.7  | 82.6  | 17.1  | 4.3   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 52.5° | 220.8  | 79.8  | 15.7  | 4.3   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 55°   | 250.7  | 76.9  | 14.2  | 2.8   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 57.5° | 290.6  | 72.7  | 14.2  | 1.4   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 59°   | 330.5  | 67.0  | 14.2  | 1.4   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 60°   | 376.1  | 64.1  | 12.8  | 1.4   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 62.5° | 621.1  | 57.0  | 11.4  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 65°   | 1199.5 | 54.1  | 10.0  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 67.5° | 1938.9 | 54.1  | 7.1   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 70°   | 2038.6 | 54.1  | 5.7   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 72.5° | 1356.2 | 44.2  | 4.3   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 75°   | 726.5  | 39.9  | 4.3   | 1.4   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 77.5° | 391.8  | 37.0  | 5.7   | 2.8   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 80°   | 172.4  | 27.1  | 7.1   | 4.3   | 2.8   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 82.5° | 68.4   | 18.5  | 8.5   | 7.1   | 5.7   | 2.8   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 85°   | 32.8   | 14.2  | 11.4  | 10.0  | 7.1   | 4.3   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 87.5° | 15.7   | 14.2  | 12.8  | 11.4  | 10.0  | 7.1   | 1.4   | 0.0   | 0.0   | 0.0   | 0.0   |
| 90°   | 0.0    | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |



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

Report Prepared for

Cooper Lighting Solutions

McGraw-Edison

Report Number: SP1-2407-184-8

Test Date: 10/10/2024

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

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

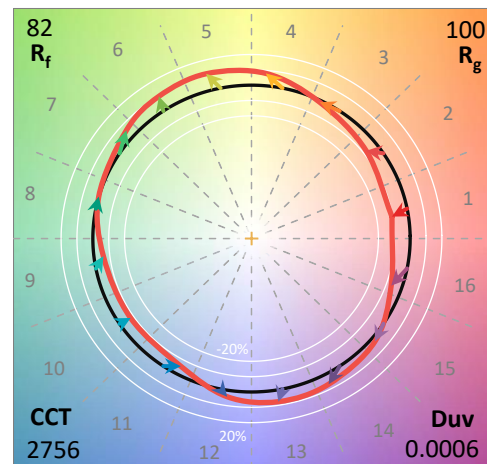
### Test Information

Test Method: LM-79-2019  
 Report Number: SP1-2407-184-8  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry:  $4\pi$   
 Issue Date: 10/15/2024  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: McGraw-Edison  
 Catalog Number: **GSS-SB1A-827-U-5WQ**  
 Description: GALLEON II SITE SLIM 1SQ 350MA 5WQ HIGH DENSITY LIGHTSQUARE WITH 80 CRI  
 2700K CCT 26 LEDS

### Spectral Parameters

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

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



### Test Conditions

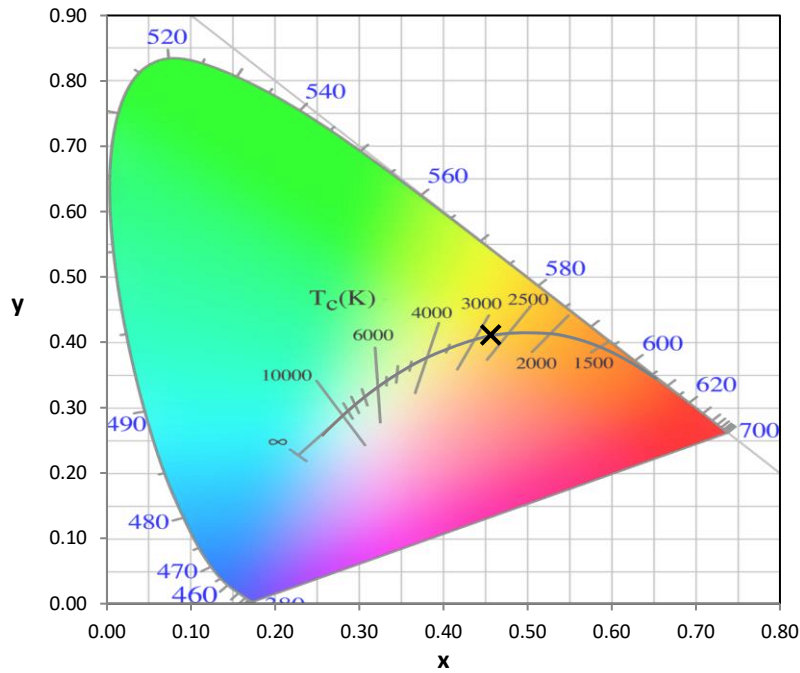
Stabilization Time: 29M  
 Operation Time: 1H 29M  
 Sphere Temperature (°C): 25.2

REPORT NUMBER: SP1-2407-184-8

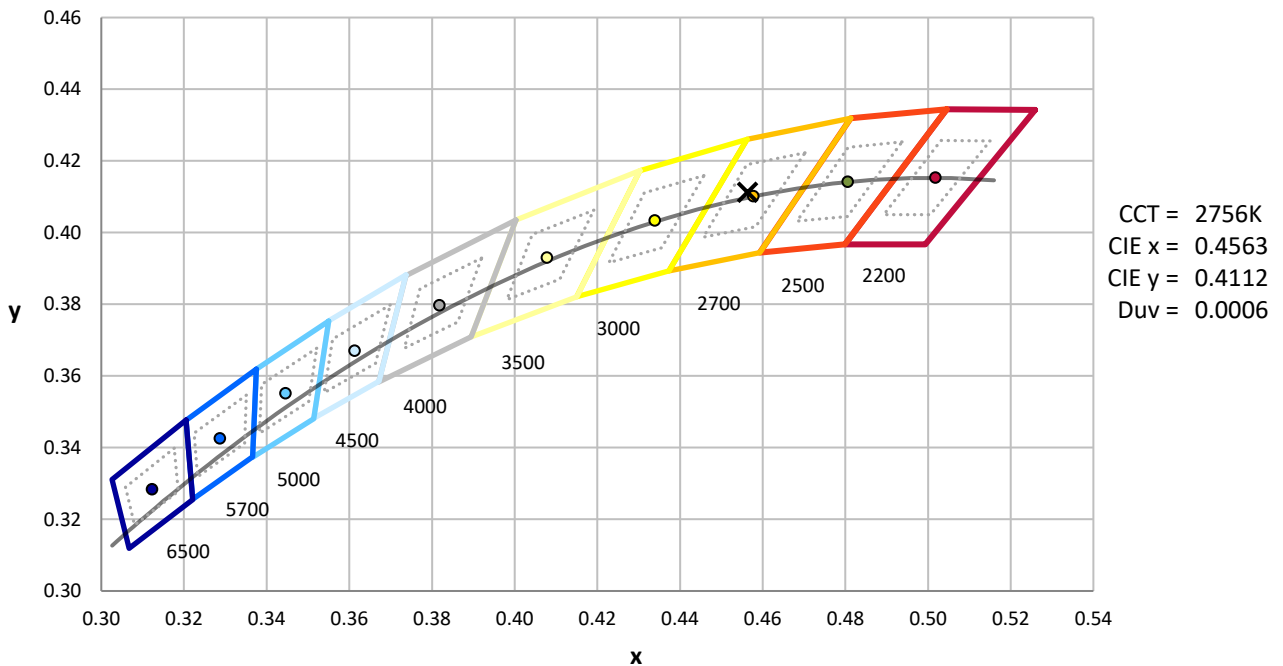
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| 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**



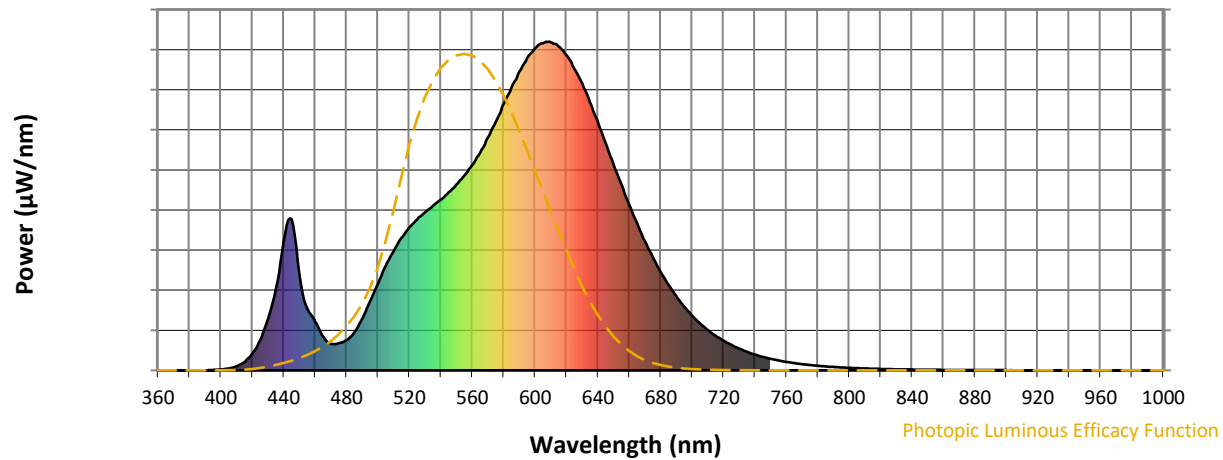
**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 2700K 4-step quadrangle

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### Photopic Flux vs. Wavelength

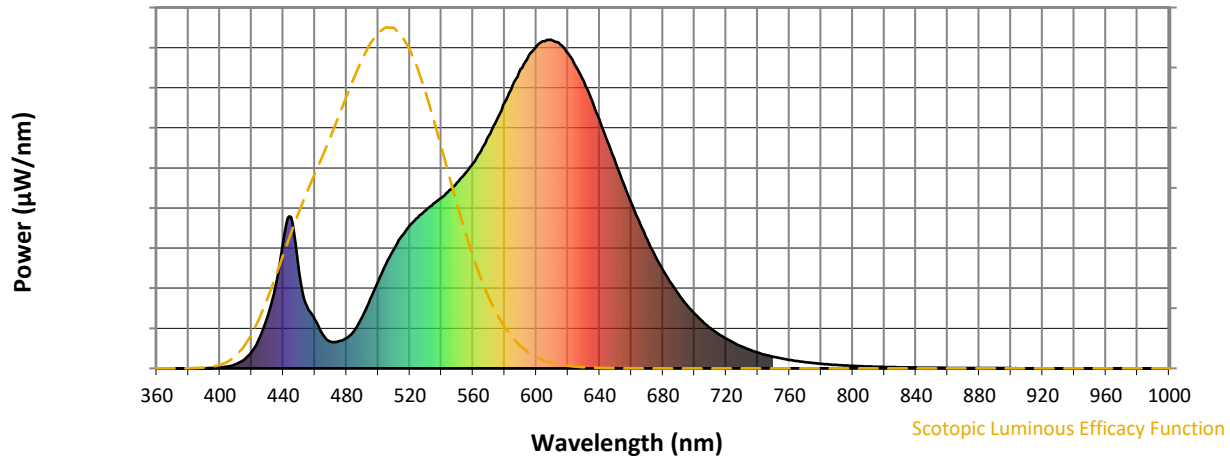


### Photopic Lumens: NR

| λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(φ/nm) |
|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|
| 360       | 0                           | NR               | 490       | 158                         | NR               | 620       | 959                         | NR               | 750       | 35                          | NR               | 880       | 1                           | NR               |
| 365       | 0                           | NR               | 495       | 211                         | NR               | 625       | 918                         | NR               | 755       | 30                          | NR               | 885       | 1                           | NR               |
| 370       | 0                           | NR               | 500       | 264                         | NR               | 630       | 873                         | NR               | 760       | 26                          | NR               | 890       | 1                           | NR               |
| 375       | 0                           | NR               | 505       | 318                         | NR               | 635       | 816                         | NR               | 765       | 22                          | NR               | 895       | 1                           | NR               |
| 380       | 0                           | NR               | 510       | 363                         | NR               | 640       | 755                         | NR               | 770       | 19                          | NR               | 900       | 1                           | NR               |
| 385       | 0                           | NR               | 515       | 403                         | NR               | 645       | 689                         | NR               | 775       | 16                          | NR               | 905       | 1                           | NR               |
| 390       | 0                           | NR               | 520       | 435                         | NR               | 650       | 626                         | NR               | 780       | 14                          | NR               | 910       | 0                           | NR               |
| 395       | 1                           | NR               | 525       | 459                         | NR               | 655       | 564                         | NR               | 785       | 12                          | NR               | 915       | 0                           | NR               |
| 400       | 3                           | NR               | 530       | 481                         | NR               | 660       | 503                         | NR               | 790       | 10                          | NR               | 920       | 0                           | NR               |
| 405       | 6                           | NR               | 535       | 501                         | NR               | 665       | 447                         | NR               | 795       | 9                           | NR               | 925       | 0                           | NR               |
| 410       | 13                          | NR               | 540       | 519                         | NR               | 670       | 392                         | NR               | 800       | 8                           | NR               | 930       | 0                           | NR               |
| 415       | 26                          | NR               | 545       | 542                         | NR               | 675       | 343                         | NR               | 805       | 7                           | NR               | 935       | 0                           | NR               |
| 420       | 51                          | NR               | 550       | 565                         | NR               | 680       | 299                         | NR               | 810       | 6                           | NR               | 940       | 0                           | NR               |
| 425       | 93                          | NR               | 555       | 593                         | NR               | 685       | 260                         | NR               | 815       | 5                           | NR               | 945       | 0                           | NR               |
| 430       | 156                         | NR               | 560       | 624                         | NR               | 690       | 225                         | NR               | 820       | 4                           | NR               | 950       | 0                           | NR               |
| 435       | 250                         | NR               | 565       | 662                         | NR               | 695       | 194                         | NR               | 825       | 4                           | NR               | 955       | 0                           | NR               |
| 440       | 391                         | NR               | 570       | 707                         | NR               | 700       | 166                         | NR               | 830       | 3                           | NR               | 960       | 0                           | NR               |
| 445       | 460                         | NR               | 575       | 756                         | NR               | 705       | 143                         | NR               | 835       | 3                           | NR               | 965       | 0                           | NR               |
| 450       | 293                         | NR               | 580       | 810                         | NR               | 710       | 122                         | NR               | 840       | 2                           | NR               | 970       | 0                           | NR               |
| 455       | 188                         | NR               | 585       | 860                         | NR               | 715       | 105                         | NR               | 845       | 2                           | NR               | 975       | 0                           | NR               |
| 460       | 149                         | NR               | 590       | 910                         | NR               | 720       | 90                          | NR               | 850       | 2                           | NR               | 980       | 0                           | NR               |
| 465       | 103                         | NR               | 595       | 950                         | NR               | 725       | 77                          | NR               | 855       | 2                           | NR               | 985       | 0                           | NR               |
| 470       | 80                          | NR               | 600       | 980                         | NR               | 730       | 66                          | NR               | 860       | 1                           | NR               | 990       | 0                           | NR               |
| 475       | 82                          | NR               | 605       | 995                         | NR               | 735       | 56                          | NR               | 865       | 1                           | NR               | 995       | 0                           | NR               |
| 480       | 92                          | NR               | 610       | 998                         | NR               | 740       | 48                          | NR               | 870       | 1                           | NR               | 1000      | 0                           | NR               |
| 485       | 116                         | NR               | 615       | 985                         | NR               | 745       | 41                          | NR               | 875       | 1                           | NR               |           |                             |                  |

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### Scotopic Flux vs. Wavelength



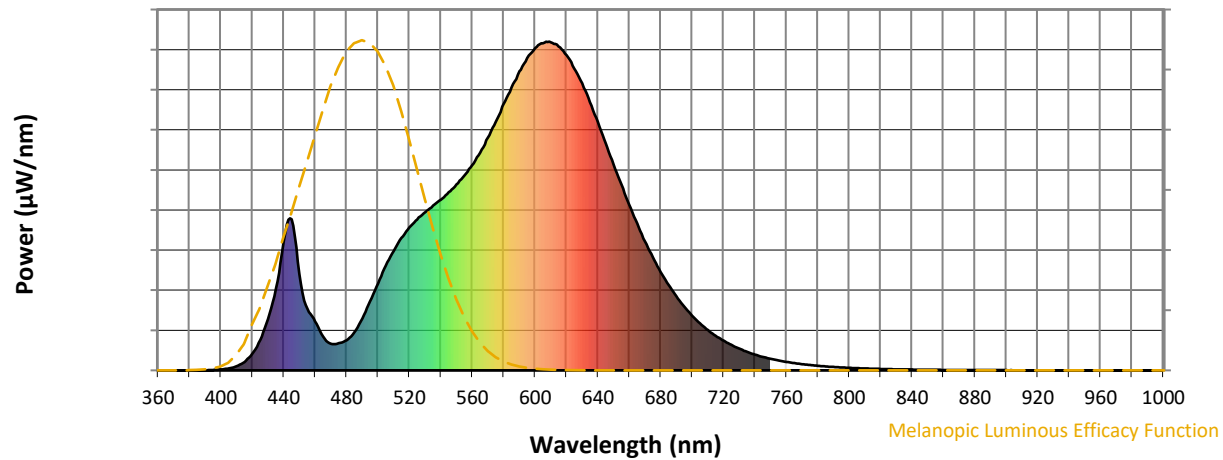
Scotopic Lumens: NR

S/P: 1.2

| λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(φ/nm) |
|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|
| 360       | 0                           | NR               | 490       | 158                         | NR               | 620       | 959                         | NR               | 750       | 35                          | NR               | 880       | 1                           | NR               |
| 365       | 0                           | NR               | 495       | 211                         | NR               | 625       | 918                         | NR               | 755       | 30                          | NR               | 885       | 1                           | NR               |
| 370       | 0                           | NR               | 500       | 264                         | NR               | 630       | 873                         | NR               | 760       | 26                          | NR               | 890       | 1                           | NR               |
| 375       | 0                           | NR               | 505       | 318                         | NR               | 635       | 816                         | NR               | 765       | 22                          | NR               | 895       | 1                           | NR               |
| 380       | 0                           | NR               | 510       | 363                         | NR               | 640       | 755                         | NR               | 770       | 19                          | NR               | 900       | 1                           | NR               |
| 385       | 0                           | NR               | 515       | 403                         | NR               | 645       | 689                         | NR               | 775       | 16                          | NR               | 905       | 1                           | NR               |
| 390       | 0                           | NR               | 520       | 435                         | NR               | 650       | 626                         | NR               | 780       | 14                          | NR               | 910       | 0                           | NR               |
| 395       | 1                           | NR               | 525       | 459                         | NR               | 655       | 564                         | NR               | 785       | 12                          | NR               | 915       | 0                           | NR               |
| 400       | 3                           | NR               | 530       | 481                         | NR               | 660       | 503                         | NR               | 790       | 10                          | NR               | 920       | 0                           | NR               |
| 405       | 6                           | NR               | 535       | 501                         | NR               | 665       | 447                         | NR               | 795       | 9                           | NR               | 925       | 0                           | NR               |
| 410       | 13                          | NR               | 540       | 519                         | NR               | 670       | 392                         | NR               | 800       | 8                           | NR               | 930       | 0                           | NR               |
| 415       | 26                          | NR               | 545       | 542                         | NR               | 675       | 343                         | NR               | 805       | 7                           | NR               | 935       | 0                           | NR               |
| 420       | 51                          | NR               | 550       | 565                         | NR               | 680       | 299                         | NR               | 810       | 6                           | NR               | 940       | 0                           | NR               |
| 425       | 93                          | NR               | 555       | 593                         | NR               | 685       | 260                         | NR               | 815       | 5                           | NR               | 945       | 0                           | NR               |
| 430       | 156                         | NR               | 560       | 624                         | NR               | 690       | 225                         | NR               | 820       | 4                           | NR               | 950       | 0                           | NR               |
| 435       | 250                         | NR               | 565       | 662                         | NR               | 695       | 194                         | NR               | 825       | 4                           | NR               | 955       | 0                           | NR               |
| 440       | 391                         | NR               | 570       | 707                         | NR               | 700       | 166                         | NR               | 830       | 3                           | NR               | 960       | 0                           | NR               |
| 445       | 460                         | NR               | 575       | 756                         | NR               | 705       | 143                         | NR               | 835       | 3                           | NR               | 965       | 0                           | NR               |
| 450       | 293                         | NR               | 580       | 810                         | NR               | 710       | 122                         | NR               | 840       | 2                           | NR               | 970       | 0                           | NR               |
| 455       | 188                         | NR               | 585       | 860                         | NR               | 715       | 105                         | NR               | 845       | 2                           | NR               | 975       | 0                           | NR               |
| 460       | 149                         | NR               | 590       | 910                         | NR               | 720       | 90                          | NR               | 850       | 2                           | NR               | 980       | 0                           | NR               |
| 465       | 103                         | NR               | 595       | 950                         | NR               | 725       | 77                          | NR               | 855       | 2                           | NR               | 985       | 0                           | NR               |
| 470       | 80                          | NR               | 600       | 980                         | NR               | 730       | 66                          | NR               | 860       | 1                           | NR               | 990       | 0                           | NR               |
| 475       | 82                          | NR               | 605       | 995                         | NR               | 735       | 56                          | NR               | 865       | 1                           | NR               | 995       | 0                           | NR               |
| 480       | 92                          | NR               | 610       | 998                         | NR               | 740       | 48                          | NR               | 870       | 1                           | NR               | 1000      | 0                           | NR               |
| 485       | 116                         | NR               | 615       | 985                         | NR               | 745       | 41                          | NR               | 875       | 1                           | NR               |           |                             |                  |

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### Melanopic Flux vs. Wavelength


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

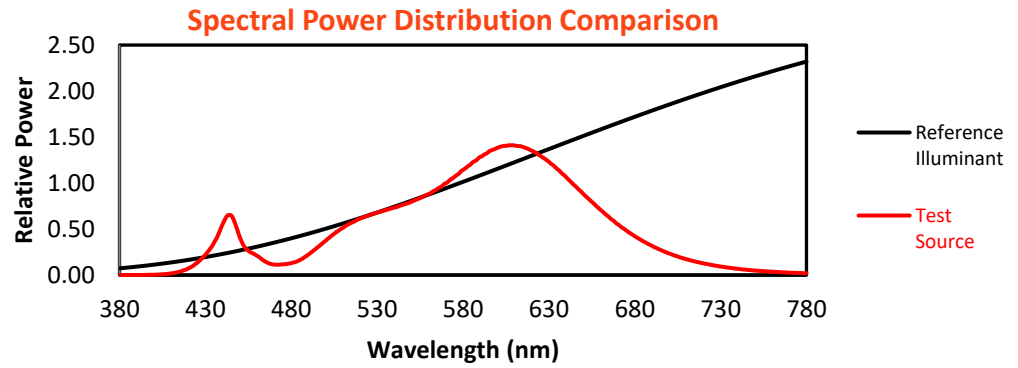
| $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) |
|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|
| 360               | 0                                    | NR                             | 490               | 158                                  | NR                             | 620               | 959                                  | NR                             | 750               | 35                                   | NR                             | 880               | 1                                    | NR                             |
| 365               | 0                                    | NR                             | 495               | 211                                  | NR                             | 625               | 918                                  | NR                             | 755               | 30                                   | NR                             | 885               | 1                                    | NR                             |
| 370               | 0                                    | NR                             | 500               | 264                                  | NR                             | 630               | 873                                  | NR                             | 760               | 26                                   | NR                             | 890               | 1                                    | NR                             |
| 375               | 0                                    | NR                             | 505               | 318                                  | NR                             | 635               | 816                                  | NR                             | 765               | 22                                   | NR                             | 895               | 1                                    | NR                             |
| 380               | 0                                    | NR                             | 510               | 363                                  | NR                             | 640               | 755                                  | NR                             | 770               | 19                                   | NR                             | 900               | 1                                    | NR                             |
| 385               | 0                                    | NR                             | 515               | 403                                  | NR                             | 645               | 689                                  | NR                             | 775               | 16                                   | NR                             | 905               | 1                                    | NR                             |
| 390               | 0                                    | NR                             | 520               | 435                                  | NR                             | 650               | 626                                  | NR                             | 780               | 14                                   | NR                             | 910               | 0                                    | NR                             |
| 395               | 1                                    | NR                             | 525               | 459                                  | NR                             | 655               | 564                                  | NR                             | 785               | 12                                   | NR                             | 915               | 0                                    | NR                             |
| 400               | 3                                    | NR                             | 530               | 481                                  | NR                             | 660               | 503                                  | NR                             | 790               | 10                                   | NR                             | 920               | 0                                    | NR                             |
| 405               | 6                                    | NR                             | 535               | 501                                  | NR                             | 665               | 447                                  | NR                             | 795               | 9                                    | NR                             | 925               | 0                                    | NR                             |
| 410               | 13                                   | NR                             | 540               | 519                                  | NR                             | 670               | 392                                  | NR                             | 800               | 8                                    | NR                             | 930               | 0                                    | NR                             |
| 415               | 26                                   | NR                             | 545               | 542                                  | NR                             | 675               | 343                                  | NR                             | 805               | 7                                    | NR                             | 935               | 0                                    | NR                             |
| 420               | 51                                   | NR                             | 550               | 565                                  | NR                             | 680               | 299                                  | NR                             | 810               | 6                                    | NR                             | 940               | 0                                    | NR                             |
| 425               | 93                                   | NR                             | 555               | 593                                  | NR                             | 685               | 260                                  | NR                             | 815               | 5                                    | NR                             | 945               | 0                                    | NR                             |
| 430               | 156                                  | NR                             | 560               | 624                                  | NR                             | 690               | 225                                  | NR                             | 820               | 4                                    | NR                             | 950               | 0                                    | NR                             |
| 435               | 250                                  | NR                             | 565               | 662                                  | NR                             | 695               | 194                                  | NR                             | 825               | 4                                    | NR                             | 955               | 0                                    | NR                             |
| 440               | 391                                  | NR                             | 570               | 707                                  | NR                             | 700               | 166                                  | NR                             | 830               | 3                                    | NR                             | 960               | 0                                    | NR                             |
| 445               | 460                                  | NR                             | 575               | 756                                  | NR                             | 705               | 143                                  | NR                             | 835               | 3                                    | NR                             | 965               | 0                                    | NR                             |
| 450               | 293                                  | NR                             | 580               | 810                                  | NR                             | 710               | 122                                  | NR                             | 840               | 2                                    | NR                             | 970               | 0                                    | NR                             |
| 455               | 188                                  | NR                             | 585               | 860                                  | NR                             | 715               | 105                                  | NR                             | 845               | 2                                    | NR                             | 975               | 0                                    | NR                             |
| 460               | 149                                  | NR                             | 590               | 910                                  | NR                             | 720               | 90                                   | NR                             | 850               | 2                                    | NR                             | 980               | 0                                    | NR                             |
| 465               | 103                                  | NR                             | 595               | 950                                  | NR                             | 725               | 77                                   | NR                             | 855               | 2                                    | NR                             | 985               | 0                                    | NR                             |
| 470               | 80                                   | NR                             | 600               | 980                                  | NR                             | 730               | 66                                   | NR                             | 860               | 1                                    | NR                             | 990               | 0                                    | NR                             |
| 475               | 82                                   | NR                             | 605               | 995                                  | NR                             | 735               | 56                                   | NR                             | 865               | 1                                    | NR                             | 995               | 0                                    | NR                             |
| 480               | 92                                   | NR                             | 610               | 998                                  | NR                             | 740               | 48                                   | NR                             | 870               | 1                                    | NR                             | 1000              | 0                                    | NR                             |
| 485               | 116                                  | NR                             | 615               | 985                                  | NR                             | 745               | 41                                   | NR                             | 875               | 1                                    | NR                             |                   |                                      |                                |

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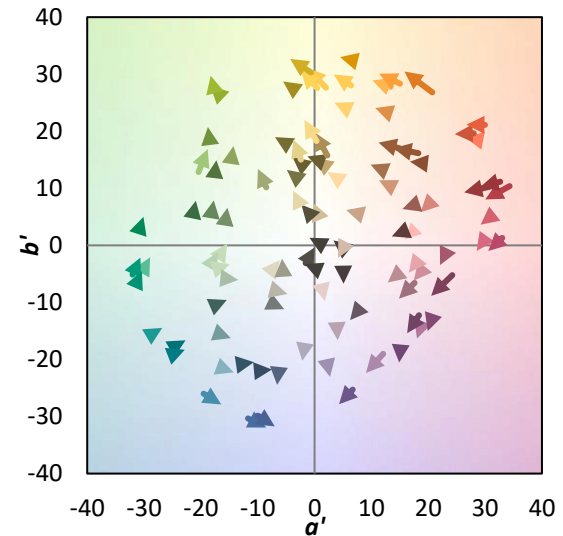
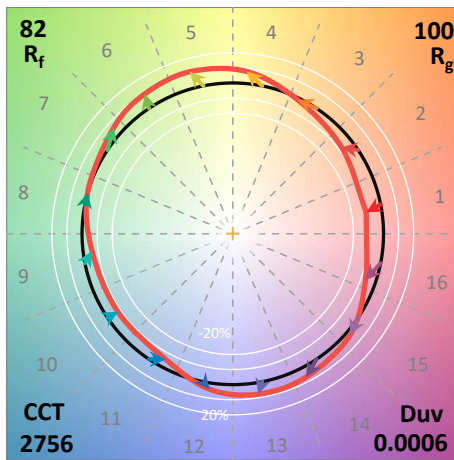
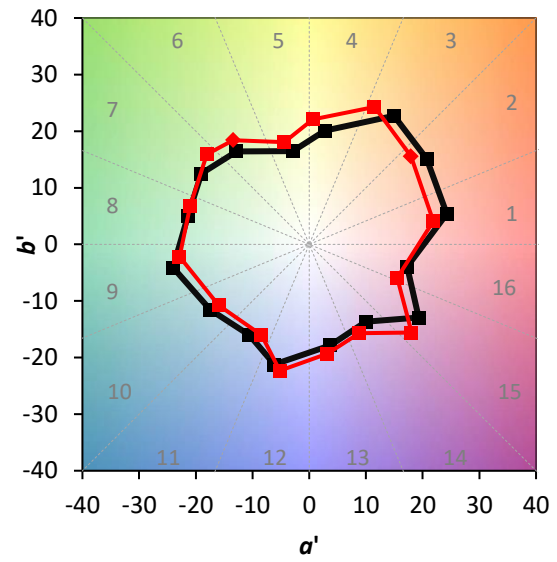
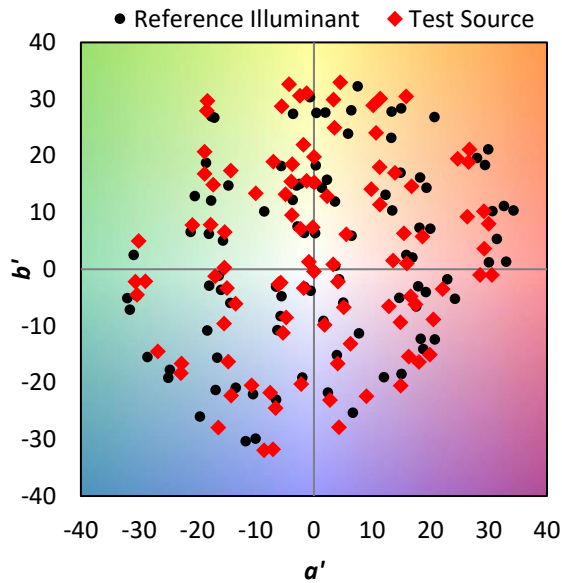
TM-30-18

### Summary

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



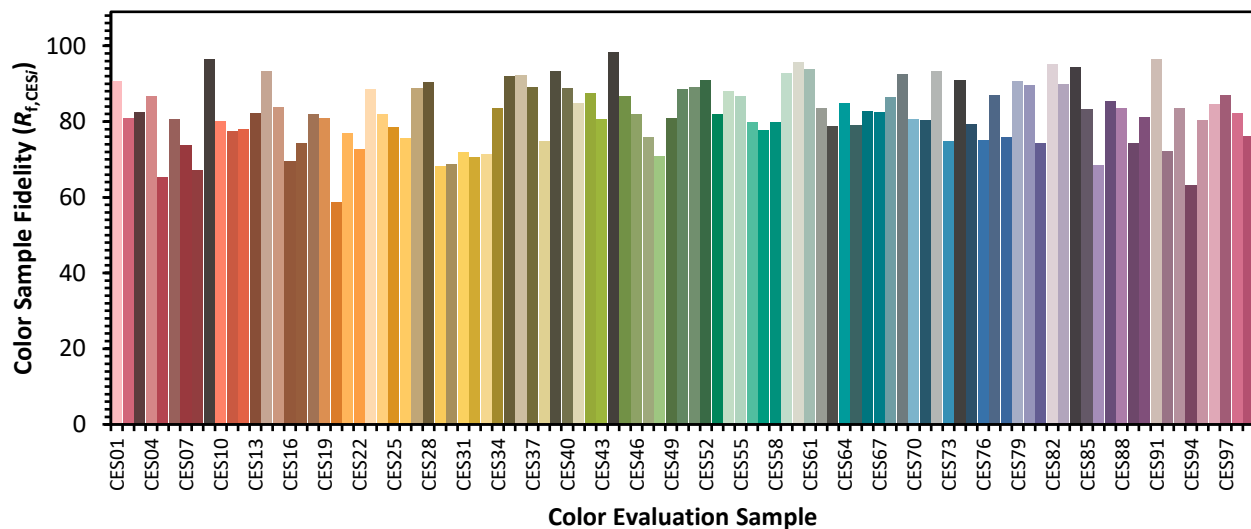
### Color Vector Graphics



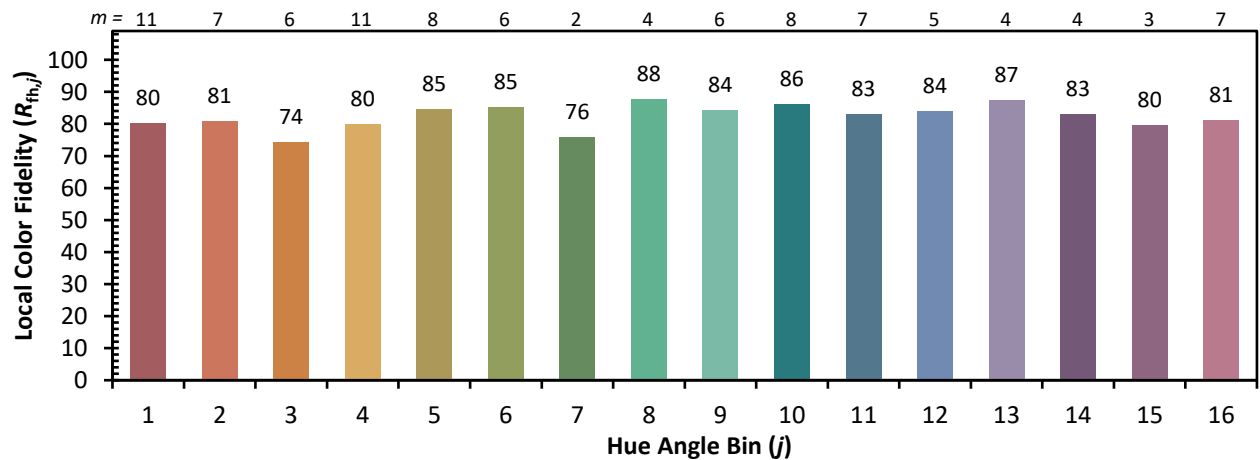
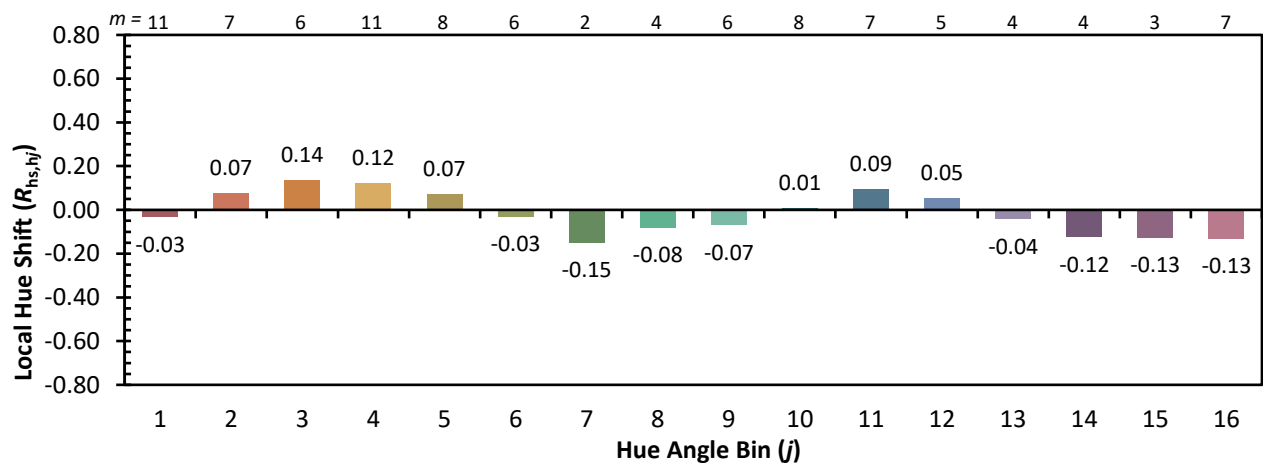
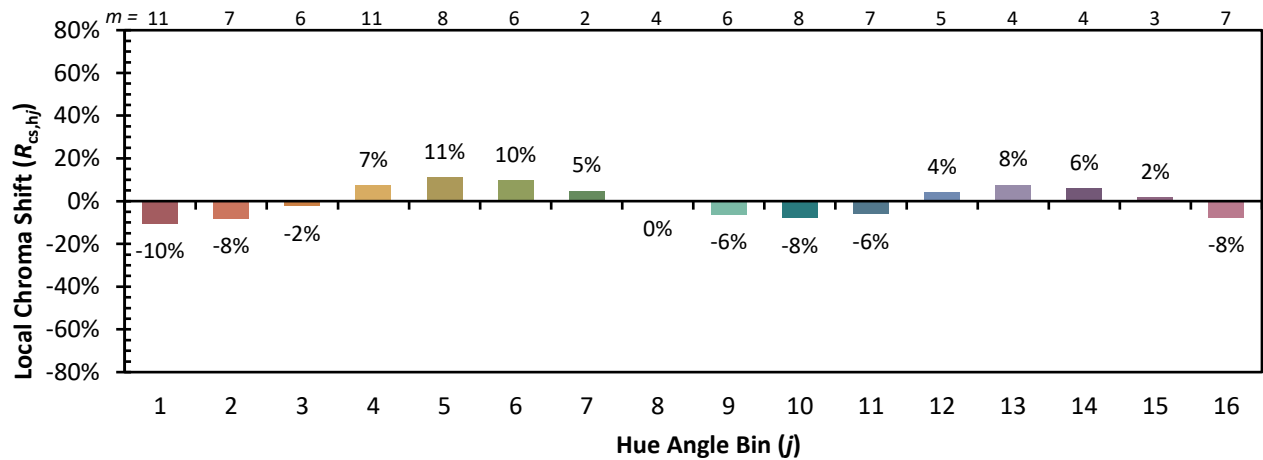


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

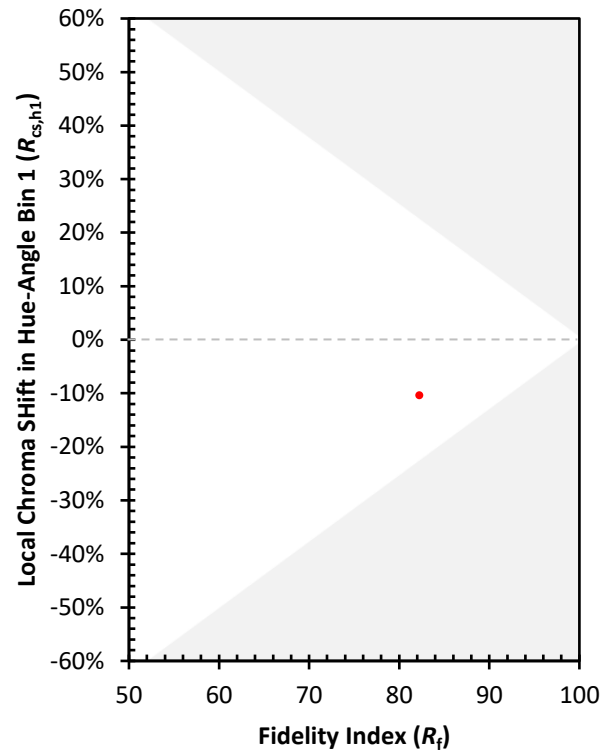
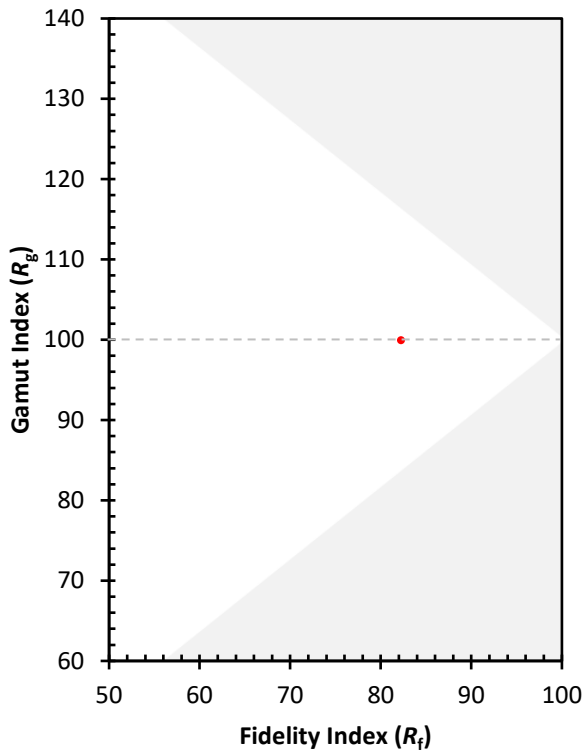
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 76 | CES51 = 89 | CES76 = 75 |
| CES02 = 63 | CES27 = 89 | CES52 = 91 | CES77 = 87 |
| CES03 = 31 | CES28 = 90 | CES53 = 82 | CES78 = 76 |
| CES04 = 71 | CES29 = 68 | CES54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



Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)