

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: P980825

Luminaire Tested: **UFLD-CA2-180-740-U-66**

Issue Date: 04/10/2025



**Test Information**

Test Method: LM-79-08  
Report Number: P980825  
Test Lab: INNOVATION CENTER(G2)  
Issue Date: 04/10/2025  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: STREETWORKS  
Catalog Number: UFLD-CA2-180-740-U-66  
Description: UTILITY FLOOD MEDIUM SIZE 180W 70CRI 4000K LED FIXTURE NEMA 6  
Light Source: (2) 4000K CCT, 70 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 27527.4 lumens  
Efficiency: N/A  
Efficacy: 152.3 lumens/watt  
Luminous Opening: Rectangular (W 1' x L: 0.31' x H: 0')  
IES Classification: Type I - Short  
BUG Rating: B4 - U0 - G2

Input Watts (W): 180.8  
Input Voltage (V): 120  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.99  
Total Harmonic Distortion (THDi): 2.8%  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 28.75 FT

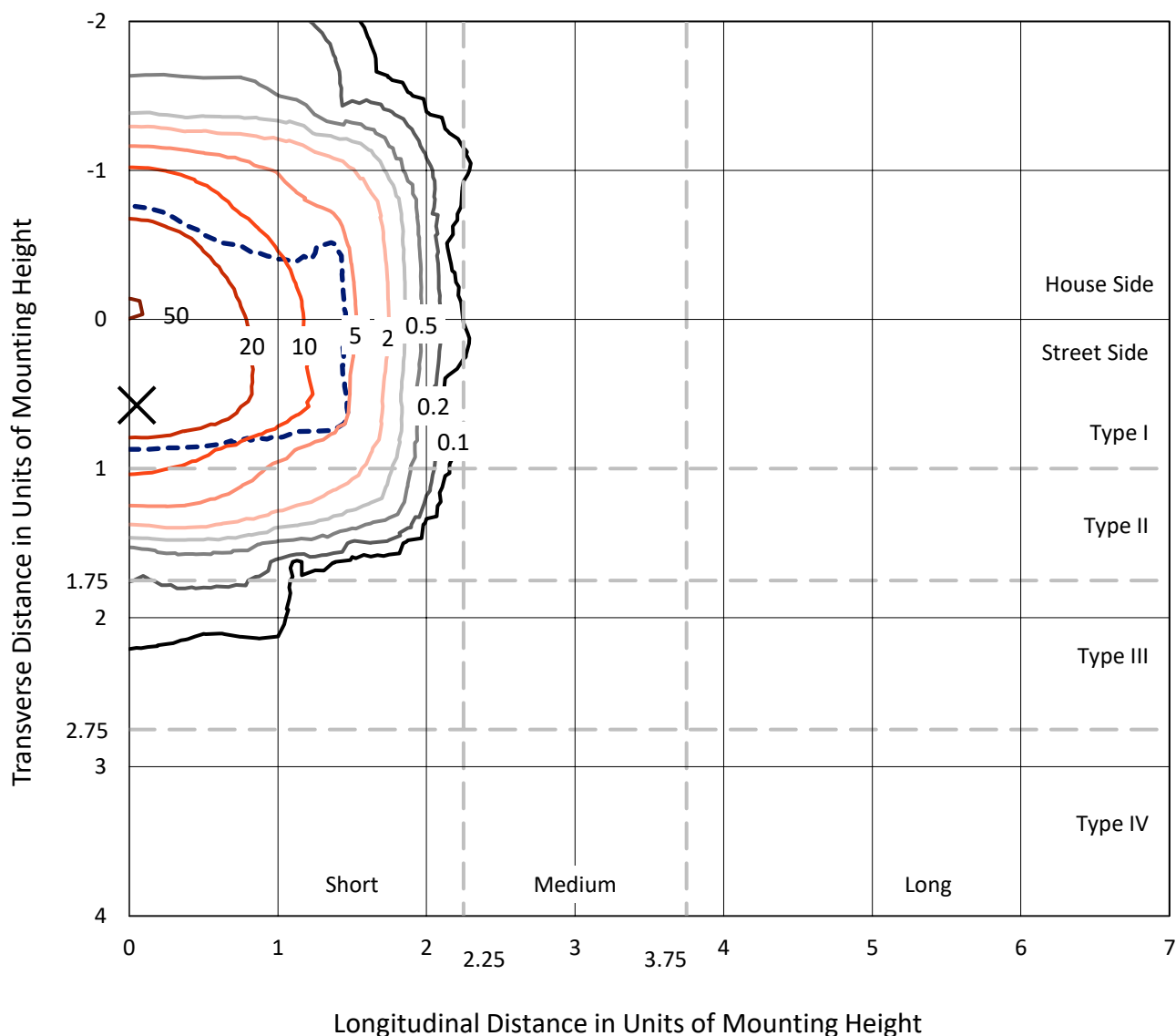
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CATALOG NUMBER: UFLD-CA2-180-740-U-66

## Iso-Footcandle Lines of Horizontal Illumination

× Max cd

--- 1/2 Max cd

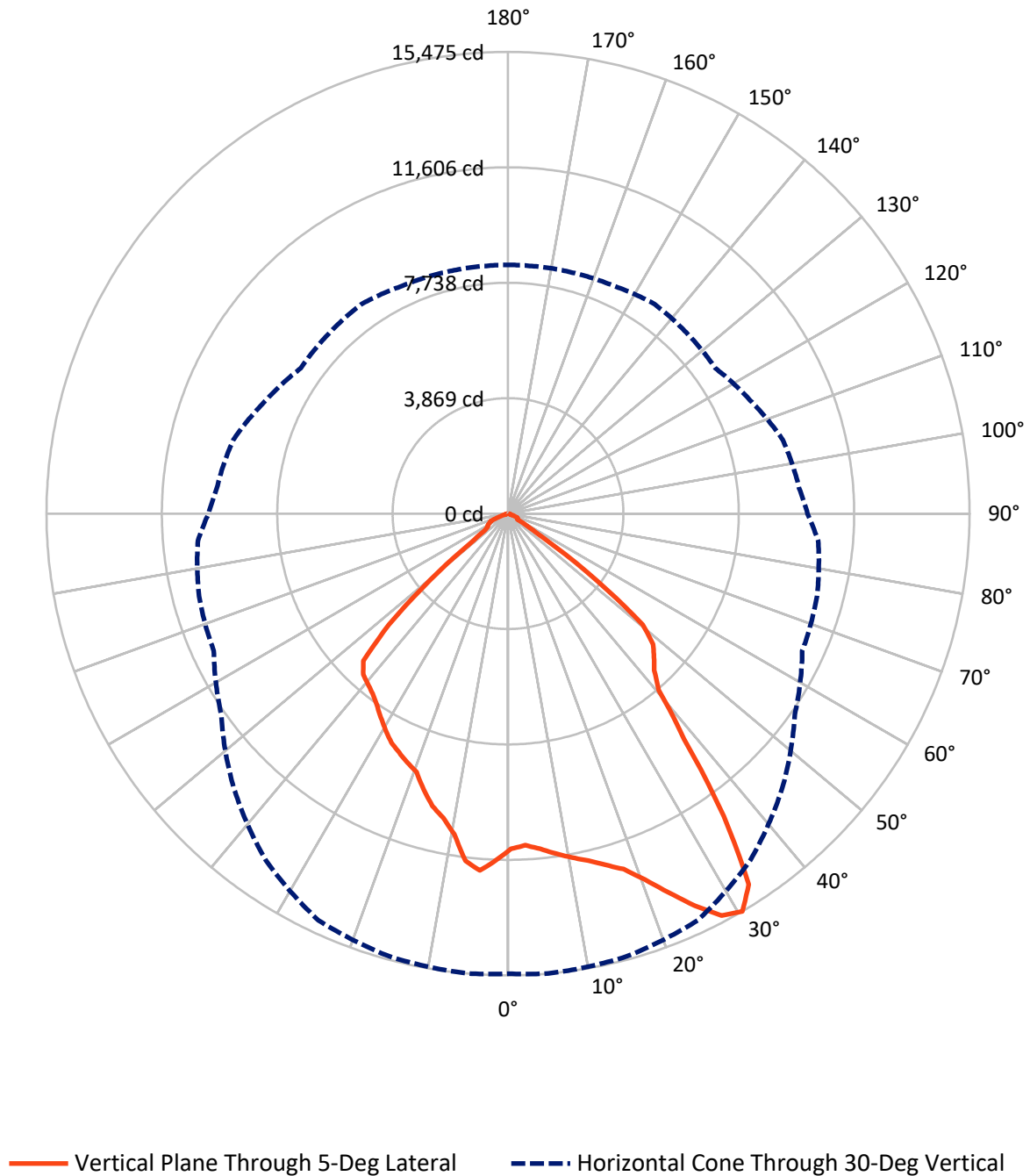


Based on 15 foot mounting height. Maximum calculated value = 51.2 fc

Type I - Short - N/A

REPORT NUMBER: P980825  
CATALOG NUMBER: UFLD-CA2-180-740-U-66

## Luminous Intensity Polar Plot



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CATALOG NUMBER: UFLD-CA2-180-740-U-66

**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 12175.1  | 0.0    | 12175.1 |
|                    | % Fixture | 44.2     | 0.0    | 44.2    |
| <b>Street Side</b> | Lumens    | 15352.3  | 0.0    | 15352.3 |
|                    | % Fixture | 55.8     | 0.0    | 55.8    |
| <b>Total</b>       | Lumens    | 27527.4  | 0.0    | 27527.4 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 1099.1  | 4.0       |
| 10°-20°   | 3184.0  | 11.6      |
| 20°-30°   | 5073.9  | 18.4      |
| 30°-40°   | 6343.2  | 23.0      |
| 40°-50°   | 6224.9  | 22.6      |
| 50°-60°   | 4450.4  | 16.2      |
| 60°-70°   | 984.7   | 3.6       |
| 70°-80°   | 151.3   | 0.5       |
| 80°-90°   | 16.0    | 0.1       |
| 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°    | 27527.4 | 100.0     |
| 0°-180°   | 27527.4 | 100.0     |

**Coefficient of Utilization**



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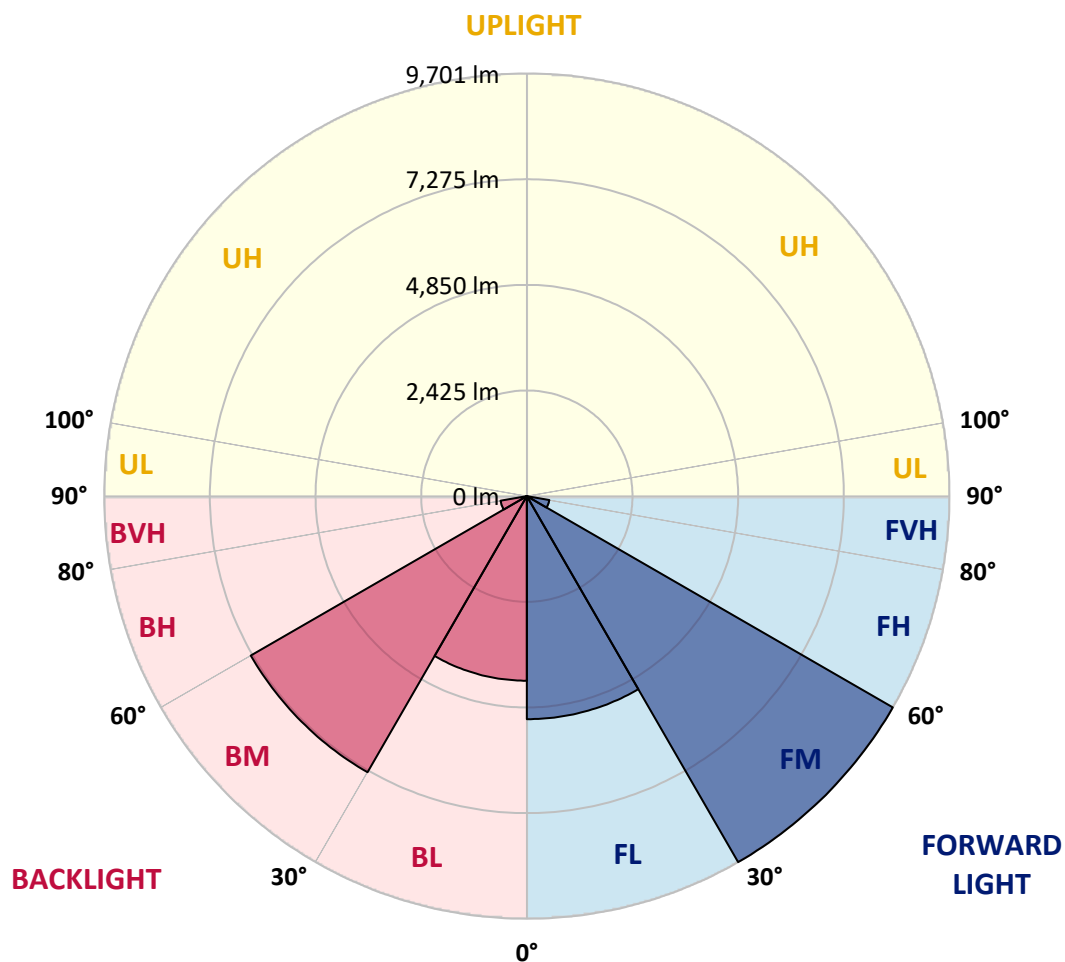
CATALOG NUMBER: UFLD-CA2-180-740-U-66

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 5119.8 | 18.6      |                         |      |         |
| FM   | (30°-60°)   | 9700.7 | 35.2      |                         |      |         |
| FH   | (60°-80°)   | 523.7  | 1.9       |                         |      | G0/660  |
| FVH  | (80°-90°)   | 8.1    | 0.0       |                         |      | G0/10   |
| BL   | (0°-30°)    | 4237.2 | 15.4      | B4/5000                 |      |         |
| BM   | (30°-60°)   | 7317.8 | 26.6      | B4/8500                 |      |         |
| BH   | (60°-80°)   | 612.2  | 2.2       | B2/1000                 |      | G2/1000 |
| BVH  | (80°-90°)   | 7.9    | 0.0       |                         |      | G0/10   |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B4-U0-G2**

Type I Short



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 45°     | 55°     | 65°     | 75°     | 85°     | 90°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 11235.7 | 11235.7 | 11235.7 | 11235.7 | 11235.7 | 11235.7 | 11235.7 | 11235.7 | 11235.7 | 11235.7 | 11235.7 |
| 2.5°  | 11110.0 | 11128.0 | 11145.9 | 11172.9 | 11208.8 | 11226.8 | 11208.8 | 11190.8 | 11181.8 | 11199.8 | 11208.8 |
| 5°    | 11262.7 | 11289.6 | 11298.6 | 11316.6 | 11334.5 | 11316.6 | 11307.6 | 11289.6 | 11280.6 | 11289.6 | 11316.6 |
| 7.5°  | 11487.2 | 11505.2 | 11496.2 | 11487.2 | 11478.2 | 11415.4 | 11352.5 | 11325.5 | 11325.5 | 11352.5 | 11424.3 |
| 10°   | 11684.8 | 11720.7 | 11675.8 | 11639.9 | 11577.0 | 11478.2 | 11370.5 | 11307.6 | 11325.5 | 11379.4 | 11469.3 |
| 12.5° | 11936.3 | 11936.3 | 11891.4 | 11855.5 | 11711.7 | 11595.0 | 11451.3 | 11352.5 | 11352.5 | 11451.3 | 11550.1 |
| 15°   | 12241.7 | 12214.7 | 12196.7 | 12097.9 | 11927.3 | 11738.7 | 11559.1 | 11415.4 | 11388.4 | 11541.1 | 11604.0 |
| 17.5° | 12627.9 | 12529.1 | 12484.2 | 12313.5 | 12080.0 | 11837.5 | 11595.0 | 11478.2 | 11397.4 | 11559.1 | 11487.2 |
| 20°   | 13157.8 | 13085.9 | 12942.2 | 12672.8 | 12196.7 | 11882.4 | 11595.0 | 11442.3 | 11379.4 | 11469.3 | 11397.4 |
| 22.5° | 13840.3 | 13795.4 | 13472.1 | 13130.8 | 12502.1 | 11918.3 | 11550.1 | 11343.5 | 11325.5 | 11280.6 | 11128.0 |
| 25°   | 14675.6 | 14558.9 | 14226.5 | 13741.5 | 12960.2 | 12268.6 | 11541.1 | 11163.9 | 11101.0 | 10984.3 | 10714.8 |
| 27.5° | 15385.1 | 15259.4 | 14855.2 | 14424.1 | 13588.9 | 12789.5 | 11613.0 | 10948.3 | 10876.5 | 10795.6 | 10463.3 |
| 30°   | 15421.1 | 15475.0 | 15367.2 | 15043.8 | 14172.7 | 13005.1 | 11738.7 | 10885.5 | 10723.8 | 10436.4 | 10041.2 |
| 32.5° | 14693.6 | 14819.3 | 15079.8 | 15196.5 | 14612.7 | 13265.5 | 11846.5 | 10912.4 | 10616.0 | 9924.5  | 9601.1  |
| 35°   | 12205.7 | 12457.2 | 13526.0 | 14531.9 | 14738.5 | 13642.8 | 11936.3 | 10912.4 | 10580.1 | 9556.2  | 9304.7  |
| 37.5° | 9376.6  | 9583.2  | 10490.3 | 12313.5 | 14181.6 | 13876.3 | 12133.9 | 10849.5 | 10535.2 | 9583.2  | 9241.9  |
| 40°   | 7661.1  | 7777.9  | 8173.1  | 9412.5  | 12223.7 | 13490.1 | 12331.5 | 10921.4 | 10400.5 | 9601.1  | 9277.8  |
| 42.5° | 7194.1  | 7185.1  | 7104.3  | 7562.3  | 9322.7  | 12358.4 | 12466.2 | 11101.0 | 10175.9 | 9484.4  | 9214.9  |
| 45°   | 6879.8  | 6861.8  | 6789.9  | 6879.8  | 7373.7  | 10113.1 | 12367.4 | 11424.3 | 9897.5  | 9071.2  | 8891.6  |
| 47.5° | 6538.5  | 6547.4  | 6520.5  | 6556.4  | 6466.6  | 7679.1  | 11810.5 | 11559.1 | 9421.5  | 8379.6  | 8316.8  |
| 50°   | 5721.2  | 5855.9  | 6215.1  | 6251.1  | 6017.5  | 6197.2  | 10113.1 | 11496.2 | 9080.2  | 8182.1  | 8128.2  |
| 52.5° | 3556.6  | 3772.2  | 4832.0  | 5730.1  | 5595.4  | 5595.4  | 7715.0  | 11586.0 | 8469.5  | 8110.2  | 8146.1  |
| 55°   | 1257.4  | 1419.1  | 2586.6  | 3942.8  | 5011.6  | 5110.4  | 6098.4  | 10310.7 | 8397.6  | 8235.9  | 8271.9  |
| 57.5° | 314.3   | 386.2   | 790.4   | 1706.5  | 3377.0  | 4634.4  | 5451.7  | 8514.4  | 6376.8  | 6152.3  | 6242.1  |
| 60°   | 368.2   | 359.3   | 494.0   | 547.9   | 1311.3  | 3664.4  | 4912.8  | 5748.1  | 4113.5  | 3853.0  | 3897.9  |
| 62.5° | 395.2   | 368.2   | 386.2   | 485.0   | 215.6   | 1796.3  | 3915.9  | 3421.9  | 1697.5  | 1257.4  | 1329.2  |
| 65°   | 350.3   | 332.3   | 305.4   | 449.1   | 152.7   | 332.3   | 2308.2  | 1005.9  | 242.5   | 386.2   | 350.3   |
| 67.5° | 233.5   | 242.5   | 251.5   | 359.3   | 143.7   | 143.7   | 305.4   | 251.5   | 170.6   | 350.3   | 305.4   |
| 70°   | 134.7   | 143.7   | 170.6   | 215.6   | 143.7   | 116.8   | 134.7   | 206.6   | 143.7   | 350.3   | 305.4   |
| 72.5° | 80.8    | 80.8    | 80.8    | 89.8    | 143.7   | 98.8    | 89.8    | 170.6   | 125.7   | 323.3   | 305.4   |
| 75°   | 62.9    | 62.9    | 62.9    | 53.9    | 125.7   | 62.9    | 62.9    | 134.7   | 107.8   | 233.5   | 233.5   |
| 77.5° | 53.9    | 53.9    | 53.9    | 44.9    | 71.9    | 53.9    | 53.9    | 98.8    | 98.8    | 116.8   | 134.7   |
| 80°   | 35.9    | 35.9    | 35.9    | 35.9    | 44.9    | 44.9    | 35.9    | 53.9    | 44.9    | 53.9    | 62.9    |
| 82.5° | 18.0    | 26.9    | 26.9    | 18.0    | 26.9    | 26.9    | 26.9    | 35.9    | 26.9    | 35.9    | 35.9    |
| 85°   | 9.0     | 9.0     | 9.0     | 9.0     | 9.0     | 9.0     | 9.0     | 18.0    | 9.0     | 9.0     | 18.0    |
| 87.5° | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| 90°   | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |



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CATALOG NUMBER: UFLD-CA2-180-740-U-66

**CANDELA DISTRIBUTION (continued):**

|       | 95°     | 105°    | 115°    | 125°    | 135°    | 145°    | 155°    | 165°    | 175°    | 180°    |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 11235.7 | 11235.7 | 11235.7 | 11235.7 | 11235.7 | 11235.7 | 11235.7 | 11235.7 | 11235.7 | 11235.7 |
| 2.5°  | 11226.8 | 11271.7 | 11334.5 | 11433.3 | 11469.3 | 11532.1 | 11586.0 | 11630.9 | 11630.9 | 11613.0 |
| 5°    | 11370.5 | 11496.2 | 11666.8 | 11819.5 | 11873.4 | 11936.3 | 11963.2 | 12008.1 | 11999.2 | 11990.2 |
| 7.5°  | 11496.2 | 11693.8 | 11873.4 | 11981.2 | 11963.2 | 11882.4 | 11828.5 | 11756.7 | 11729.7 | 11747.7 |
| 10°   | 11595.0 | 11774.6 | 11855.5 | 11783.6 | 11568.0 | 11379.4 | 11136.9 | 10975.3 | 10894.4 | 10921.4 |
| 12.5° | 11630.9 | 11693.8 | 11621.9 | 11226.8 | 10957.3 | 10777.7 | 10580.1 | 10472.3 | 10427.4 | 10436.4 |
| 15°   | 11639.9 | 11496.2 | 11101.0 | 10804.6 | 10607.0 | 10382.5 | 10220.8 | 10122.0 | 10122.0 | 10131.0 |
| 17.5° | 11451.3 | 11101.0 | 10759.7 | 10535.2 | 10256.8 | 10023.2 | 9933.4  | 9897.5  | 9673.0  | 9708.9  |
| 20°   | 11280.6 | 10777.7 | 10589.1 | 10238.8 | 9906.5  | 9753.8  | 9232.9  | 9179.0  | 9188.0  | 9197.0  |
| 22.5° | 10921.4 | 10544.2 | 10373.5 | 9915.5  | 9538.2  | 9116.1  | 9044.3  | 8990.4  | 8999.4  | 8999.4  |
| 25°   | 10427.4 | 10211.9 | 9978.3  | 9502.3  | 9044.3  | 8963.4  | 8909.6  | 8837.7  | 8801.8  | 8810.8  |
| 27.5° | 10149.0 | 9879.5  | 9448.4  | 9044.3  | 8747.9  | 8783.8  | 8720.9  | 8613.2  | 8613.2  | 8622.1  |
| 30°   | 9798.7  | 9538.2  | 8963.4  | 8487.4  | 8514.4  | 8568.3  | 8415.6  | 8361.7  | 8334.7  | 8334.7  |
| 32.5° | 9367.6  | 9008.3  | 8505.4  | 8056.3  | 8218.0  | 8200.0  | 8011.4  | 8029.4  | 8047.3  | 8029.4  |
| 35°   | 9044.3  | 8577.2  | 8155.1  | 7912.6  | 7849.7  | 7777.9  | 7679.1  | 7742.0  | 7768.9  | 7751.0  |
| 37.5° | 8963.4  | 8406.6  | 7966.5  | 7795.9  | 7553.4  | 7418.6  | 7445.6  | 7508.5  | 7544.4  | 7535.4  |
| 40°   | 8936.5  | 8235.9  | 7804.8  | 7625.2  | 7301.9  | 7185.1  | 7221.0  | 7346.8  | 7391.7  | 7382.7  |
| 42.5° | 8900.6  | 8119.2  | 7706.0  | 7490.5  | 7041.4  | 6960.6  | 7131.2  | 7248.0  | 7257.0  | 7248.0  |
| 45°   | 8712.0  | 7993.4  | 7643.2  | 7212.1  | 6646.2  | 6745.0  | 6960.6  | 7023.5  | 6915.7  | 6870.8  |
| 47.5° | 8271.9  | 7759.9  | 7454.6  | 6870.8  | 6322.9  | 6511.5  | 6538.5  | 5855.9  | 5460.7  | 5370.9  |
| 50°   | 8146.1  | 7768.9  | 7239.0  | 6466.6  | 6125.3  | 6313.9  | 5137.4  | 3924.9  | 3430.9  | 3332.1  |
| 52.5° | 8110.2  | 7679.1  | 7319.8  | 6044.5  | 6053.5  | 5326.0  | 3242.3  | 1922.0  | 1544.8  | 1473.0  |
| 55°   | 8200.0  | 8074.3  | 7454.6  | 5793.0  | 5631.3  | 3466.8  | 1508.9  | 907.1   | 934.1   | 907.1   |
| 57.5° | 6188.2  | 6754.0  | 7616.2  | 5397.8  | 4113.5  | 1670.5  | 952.0   | 880.2   | 817.3   | 799.3   |
| 60°   | 3862.0  | 4400.9  | 5577.5  | 4643.4  | 2110.6  | 996.9   | 970.0   | 817.3   | 790.4   | 781.4   |
| 62.5° | 1275.4  | 1957.9  | 3197.4  | 3053.7  | 583.8   | 988.0   | 979.0   | 727.5   | 727.5   | 727.5   |
| 65°   | 323.3   | 332.3   | 880.2   | 1050.8  | 431.1   | 880.2   | 934.1   | 682.6   | 664.6   | 691.6   |
| 67.5° | 278.4   | 251.5   | 467.0   | 413.1   | 359.3   | 610.7   | 817.3   | 655.6   | 619.7   | 619.7   |
| 70°   | 278.4   | 296.4   | 458.1   | 386.2   | 224.5   | 332.3   | 592.8   | 404.2   | 359.3   | 332.3   |
| 72.5° | 260.5   | 287.4   | 404.2   | 350.3   | 152.7   | 161.7   | 260.5   | 134.7   | 125.7   | 107.8   |
| 75°   | 224.5   | 233.5   | 314.3   | 314.3   | 161.7   | 80.8    | 107.8   | 89.8    | 89.8    | 80.8    |
| 77.5° | 152.7   | 116.8   | 179.6   | 224.5   | 116.8   | 53.9    | 44.9    | 44.9    | 44.9    | 35.9    |
| 80°   | 80.8    | 44.9    | 44.9    | 35.9    | 44.9    | 44.9    | 26.9    | 35.9    | 35.9    | 26.9    |
| 82.5° | 44.9    | 26.9    | 26.9    | 18.0    | 18.0    | 26.9    | 18.0    | 18.0    | 18.0    | 18.0    |
| 85°   | 18.0    | 18.0    | 9.0     | 9.0     | 9.0     | 18.0    | 9.0     | 9.0     | 9.0     | 9.0     |
| 87.5° | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 9.0     | 9.0     |
| 90°   | 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

Lumark

Report Number: SP1-2501-319-11

Test Date: 02/05/2025

Luminaire Tested: NFFLD-C55-7050-66

Data in this report applies to families of products including NFFLD-C55-7050-66

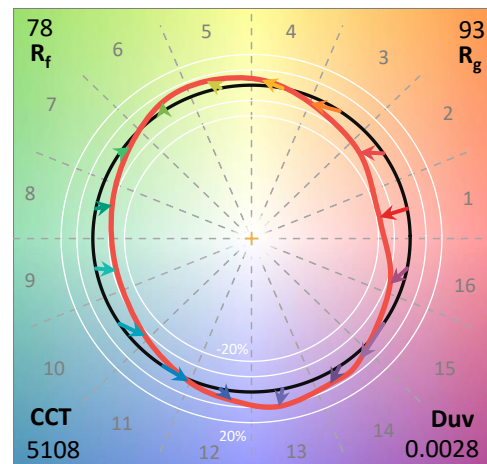
### Test Information

Test Method: LM-79-2019  
 Report Number: SP1-2501-319-11  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry:  $4\pi$   
 Issue Date: 02/06/2025  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: Lumark  
 Catalog Number: **NFFLD-C55-7050-66**  
 Description: LUMARK NIGHT FALCON 16900LM NEMA 6

### Spectral Parameters

CCT (K): 5108  
 CIE  $u'$ : 0.2083  
 CIE  $v'$ : 0.4860  
 Duv: 0.0028  
 CIE x: 0.3426  
 CIE y: 0.3552  
 CIE z: 0.3022  
 Peak Wavelength (nm): 449  
 Dominant Wavelength (nm): 568  
 Purity: 9.36717  
 R<sub>f</sub>: 77.8  
 R<sub>g</sub>: 93.2

CRI (Ra): 75.3  
 R1: 71.3  
 R2: 82.0  
 R3: 90.0  
 R4: 74.3  
 R5: 73.5  
 R6: 75.6  
 R7: 81.5  
 R8: 54.1  
 R9: -33.6  
 R10: 58.1  
 R11: 71.9  
 R12: 56.4  
 R13: 73.5  
 R14: 94.6  
 R15: 63.4



### Test Conditions

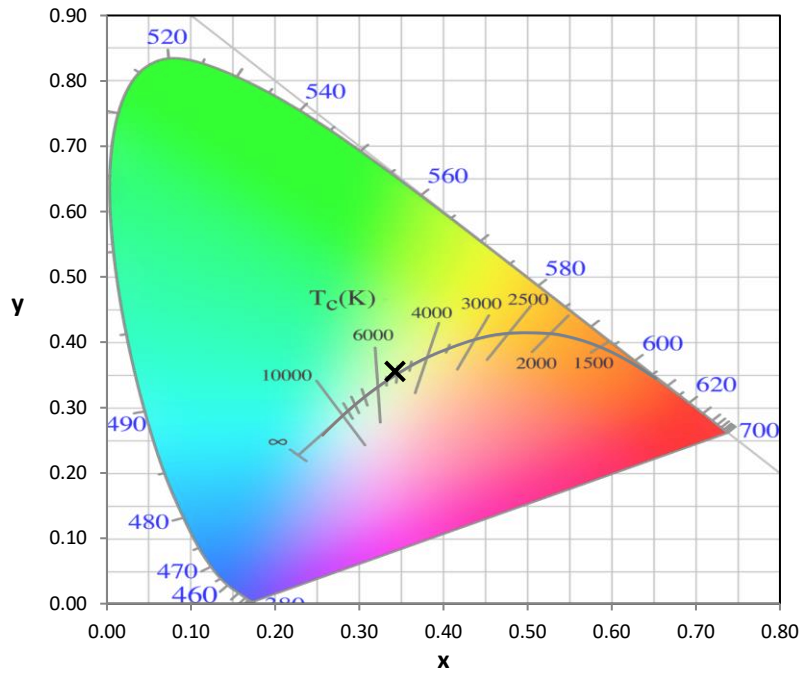
Stabilization Time: 48M  
 Operation Time: 1H 48M  
 Sphere Temperature (°C): 25.0

REPORT NUMBER: SP1-2501-319-11

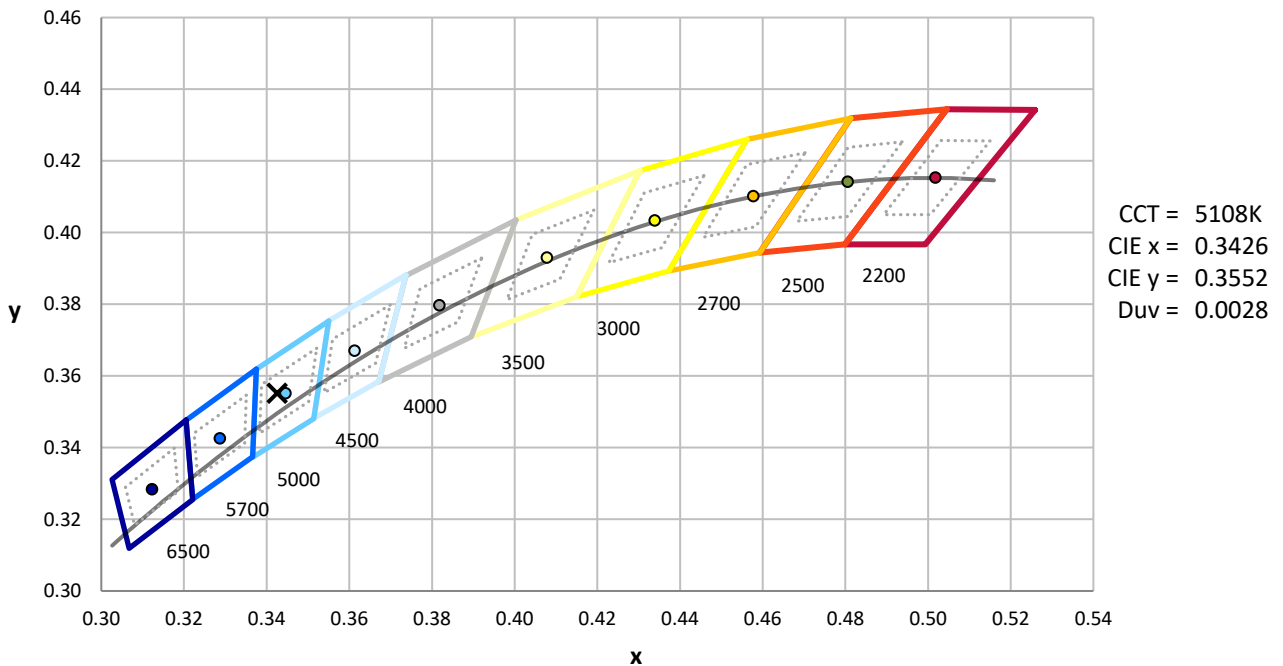
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | IN0058                | 12/16/2024       | 6/16/2025            |
| Power Meter                    | INXT2011004           | 1/21/2025        | 1/21/2026            |
| AC Power Source                | IN0063                | 10/22/2024       | 10/22/2025           |
| DC Power Source                | IN0208                | 10/22/2024       | 10/22/2025           |
| Sphere Thermometer             | IN0085                | 10/22/2024       | 10/22/2025           |
| Room Thermometer               | IN0046                | 10/22/2024       | 10/22/2025           |

REPORT NUMBER: SP1-2501-319-11

**CIE 1931 Chromaticity Diagram**



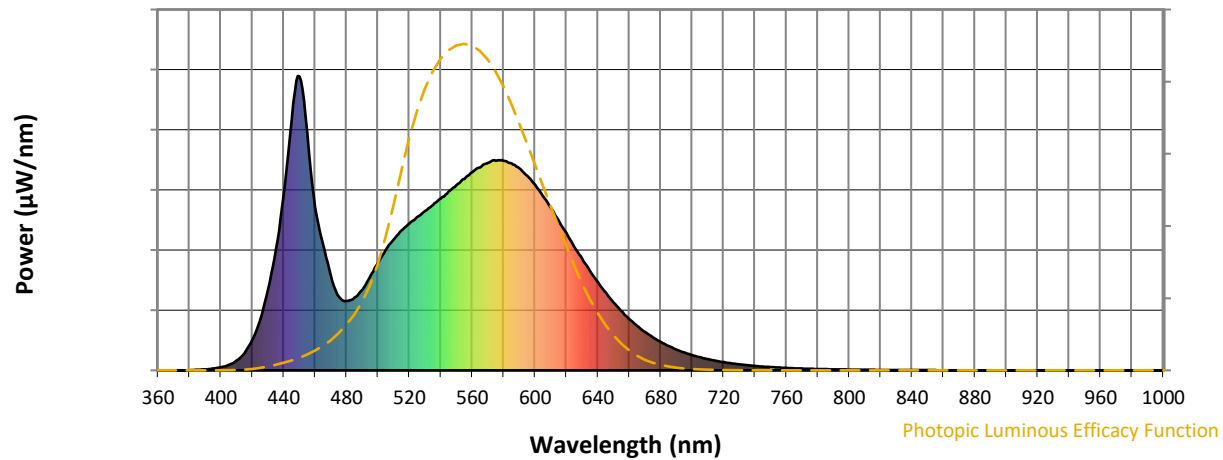
**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 5000K 4-step quadrangle

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### Photopic Flux vs. Wavelength

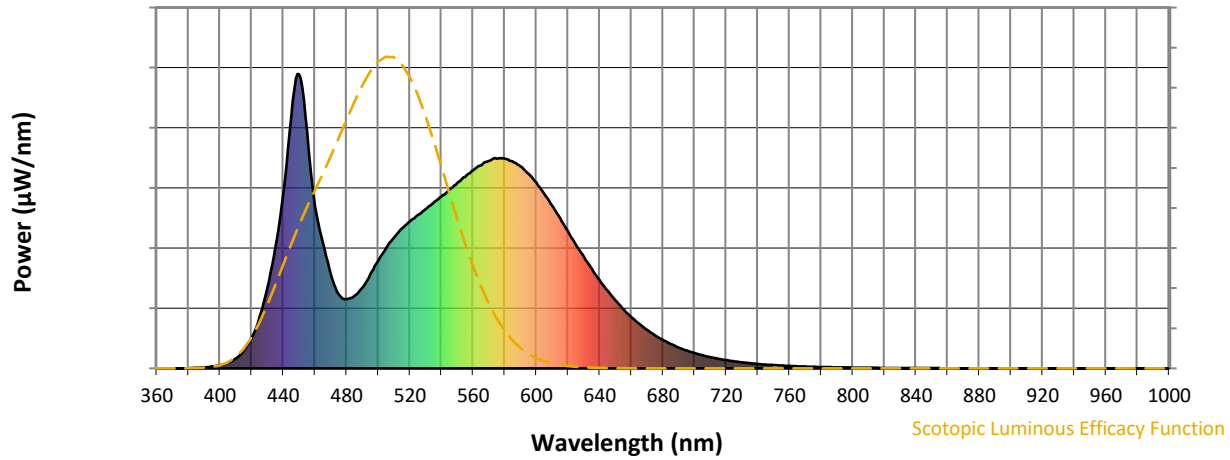


### Photopic Lumens: NR

| $\lambda$<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               | 274                                  | NR                             | 620               | 466                                  | NR                             | 750               | 11                                   | NR                             | 880               | 0                                    | NR                             |
| 365               | 0                                    | NR                             | 495               | 319                                  | NR                             | 625               | 420                                  | NR                             | 755               | 10                                   | NR                             | 885               | 0                                    | NR                             |
| 370               | 0                                    | NR                             | 500               | 366                                  | NR                             | 630               | 380                                  | NR                             | 760               | 8                                    | NR                             | 890               | 0                                    | NR                             |
| 375               | 0                                    | NR                             | 505               | 409                                  | NR                             | 635               | 338                                  | NR                             | 765               | 7                                    | NR                             | 895               | 0                                    | NR                             |
| 380               | 0                                    | NR                             | 510               | 445                                  | NR                             | 640               | 300                                  | NR                             | 770               | 6                                    | NR                             | 900               | 0                                    | NR                             |
| 385               | 2                                    | NR                             | 515               | 475                                  | NR                             | 645               | 264                                  | NR                             | 775               | 5                                    | NR                             | 905               | 0                                    | NR                             |
| 390               | 4                                    | NR                             | 520               | 499                                  | NR                             | 650               | 230                                  | NR                             | 780               | 5                                    | NR                             | 910               | 0                                    | NR                             |
| 395               | 6                                    | NR                             | 525               | 520                                  | NR                             | 655               | 201                                  | NR                             | 785               | 4                                    | NR                             | 915               | 0                                    | NR                             |
| 400               | 10                                   | NR                             | 530               | 542                                  | NR                             | 660               | 174                                  | NR                             | 790               | 3                                    | NR                             | 920               | 0                                    | NR                             |
| 405               | 18                                   | NR                             | 535               | 562                                  | NR                             | 665               | 151                                  | NR                             | 795               | 3                                    | NR                             | 925               | 0                                    | NR                             |
| 410               | 33                                   | NR                             | 540               | 584                                  | NR                             | 670               | 131                                  | NR                             | 800               | 3                                    | NR                             | 930               | 0                                    | NR                             |
| 415               | 59                                   | NR                             | 545               | 607                                  | NR                             | 675               | 112                                  | NR                             | 805               | 2                                    | NR                             | 935               | 0                                    | NR                             |
| 420               | 103                                  | NR                             | 550               | 629                                  | NR                             | 680               | 97                                   | NR                             | 810               | 2                                    | NR                             | 940               | 0                                    | NR                             |
| 425               | 173                                  | NR                             | 555               | 650                                  | NR                             | 685               | 83                                   | NR                             | 815               | 2                                    | NR                             | 945               | 0                                    | NR                             |
| 430               | 274                                  | NR                             | 560               | 673                                  | NR                             | 690               | 71                                   | NR                             | 820               | 2                                    | NR                             | 950               | 0                                    | NR                             |
| 435               | 412                                  | NR                             | 565               | 690                                  | NR                             | 695               | 61                                   | NR                             | 825               | 1                                    | NR                             | 955               | 0                                    | NR                             |
| 440               | 595                                  | NR                             | 570               | 705                                  | NR                             | 700               | 52                                   | NR                             | 830               | 1                                    | NR                             | 960               | 0                                    | NR                             |
| 445               | 849                                  | NR                             | 575               | 712                                  | NR                             | 705               | 44                                   | NR                             | 835               | 1                                    | NR                             | 965               | 0                                    | NR                             |
| 450               | 999                                  | NR                             | 580               | 713                                  | NR                             | 710               | 38                                   | NR                             | 840               | 1                                    | NR                             | 970               | 0                                    | NR                             |
| 455               | 805                                  | NR                             | 585               | 703                                  | NR                             | 715               | 33                                   | NR                             | 845               | 1                                    | NR                             | 975               | 0                                    | NR                             |
| 460               | 555                                  | NR                             | 590               | 686                                  | NR                             | 720               | 28                                   | NR                             | 850               | 1                                    | NR                             | 980               | 0                                    | NR                             |
| 465               | 428                                  | NR                             | 595               | 661                                  | NR                             | 725               | 24                                   | NR                             | 855               | 1                                    | NR                             | 985               | 0                                    | NR                             |
| 470               | 319                                  | NR                             | 600               | 630                                  | NR                             | 730               | 20                                   | NR                             | 860               | 1                                    | NR                             | 990               | 0                                    | NR                             |
| 475               | 251                                  | NR                             | 605               | 593                                  | NR                             | 735               | 18                                   | NR                             | 865               | 1                                    | NR                             | 995               | 0                                    | NR                             |
| 480               | 236                                  | NR                             | 610               | 552                                  | NR                             | 740               | 15                                   | NR                             | 870               | 0                                    | NR                             | 1000              | 0                                    | NR                             |
| 485               | 247                                  | NR                             | 615               | 510                                  | NR                             | 745               | 13                                   | NR                             | 875               | 0                                    | NR                             |                   |                                      |                                |

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### Scotopic Flux vs. Wavelength



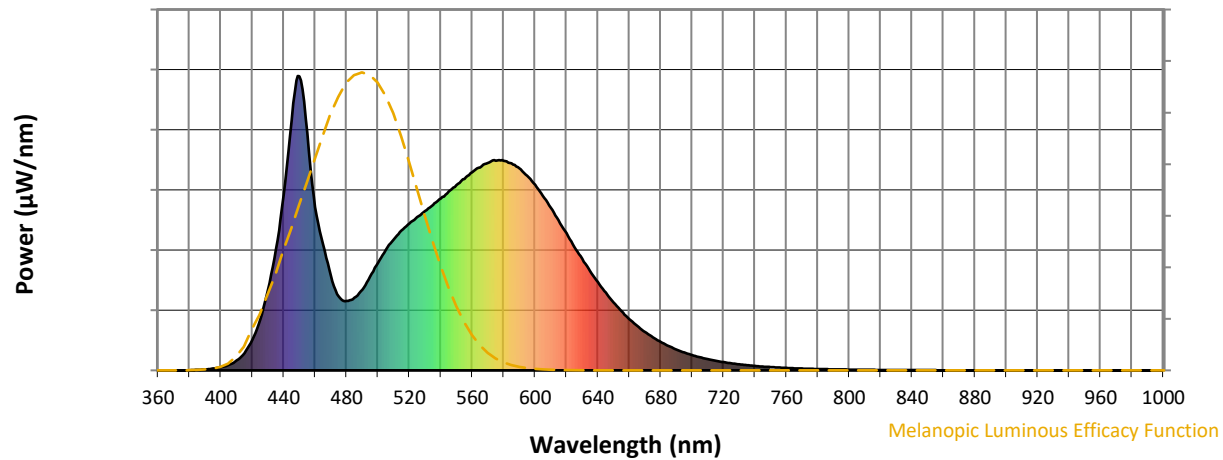
Scotopic Lumens: NR

S/P: 1.89

| λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) |
|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|
| 360    | 0                        | NR            | 490    | 274                      | NR            | 620    | 466                      | NR            | 750    | 11                       | NR            | 880    | 0                        | NR            |
| 365    | 0                        | NR            | 495    | 319                      | NR            | 625    | 420                      | NR            | 755    | 10                       | NR            | 885    | 0                        | NR            |
| 370    | 0                        | NR            | 500    | 366                      | NR            | 630    | 380                      | NR            | 760    | 8                        | NR            | 890    | 0                        | NR            |
| 375    | 0                        | NR            | 505    | 409                      | NR            | 635    | 338                      | NR            | 765    | 7                        | NR            | 895    | 0                        | NR            |
| 380    | 0                        | NR            | 510    | 445                      | NR            | 640    | 300                      | NR            | 770    | 6                        | NR            | 900    | 0                        | NR            |
| 385    | 2                        | NR            | 515    | 475                      | NR            | 645    | 264                      | NR            | 775    | 5                        | NR            | 905    | 0                        | NR            |
| 390    | 4                        | NR            | 520    | 499                      | NR            | 650    | 230                      | NR            | 780    | 5                        | NR            | 910    | 0                        | NR            |
| 395    | 6                        | NR            | 525    | 520                      | NR            | 655    | 201                      | NR            | 785    | 4                        | NR            | 915    | 0                        | NR            |
| 400    | 10                       | NR            | 530    | 542                      | NR            | 660    | 174                      | NR            | 790    | 3                        | NR            | 920    | 0                        | NR            |
| 405    | 18                       | NR            | 535    | 562                      | NR            | 665    | 151                      | NR            | 795    | 3                        | NR            | 925    | 0                        | NR            |
| 410    | 33                       | NR            | 540    | 584                      | NR            | 670    | 131                      | NR            | 800    | 3                        | NR            | 930    | 0                        | NR            |
| 415    | 59                       | NR            | 545    | 607                      | NR            | 675    | 112                      | NR            | 805    | 2                        | NR            | 935    | 0                        | NR            |
| 420    | 103                      | NR            | 550    | 629                      | NR            | 680    | 97                       | NR            | 810    | 2                        | NR            | 940    | 0                        | NR            |
| 425    | 173                      | NR            | 555    | 650                      | NR            | 685    | 83                       | NR            | 815    | 2                        | NR            | 945    | 0                        | NR            |
| 430    | 274                      | NR            | 560    | 673                      | NR            | 690    | 71                       | NR            | 820    | 2                        | NR            | 950    | 0                        | NR            |
| 435    | 412                      | NR            | 565    | 690                      | NR            | 695    | 61                       | NR            | 825    | 1                        | NR            | 955    | 0                        | NR            |
| 440    | 595                      | NR            | 570    | 705                      | NR            | 700    | 52                       | NR            | 830    | 1                        | NR            | 960    | 0                        | NR            |
| 445    | 849                      | NR            | 575    | 712                      | NR            | 705    | 44                       | NR            | 835    | 1                        | NR            | 965    | 0                        | NR            |
| 450    | 999                      | NR            | 580    | 713                      | NR            | 710    | 38                       | NR            | 840    | 1                        | NR            | 970    | 0                        | NR            |
| 455    | 805                      | NR            | 585    | 703                      | NR            | 715    | 33                       | NR            | 845    | 1                        | NR            | 975    | 0                        | NR            |
| 460    | 555                      | NR            | 590    | 686                      | NR            | 720    | 28                       | NR            | 850    | 1                        | NR            | 980    | 0                        | NR            |
| 465    | 428                      | NR            | 595    | 661                      | NR            | 725    | 24                       | NR            | 855    | 1                        | NR            | 985    | 0                        | NR            |
| 470    | 319                      | NR            | 600    | 630                      | NR            | 730    | 20                       | NR            | 860    | 1                        | NR            | 990    | 0                        | NR            |
| 475    | 251                      | NR            | 605    | 593                      | NR            | 735    | 18                       | NR            | 865    | 1                        | NR            | 995    | 0                        | NR            |
| 480    | 236                      | NR            | 610    | 552                      | NR            | 740    | 15                       | NR            | 870    | 0                        | NR            | 1000   | 0                        | NR            |
| 485    | 247                      | NR            | 615    | 510                      | NR            | 745    | 13                       | NR            | 875    | 0                        | NR            |        |                          |               |

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### Melanopic Flux vs. Wavelength



Melanopic Lumens: NR

M/P: 3.96

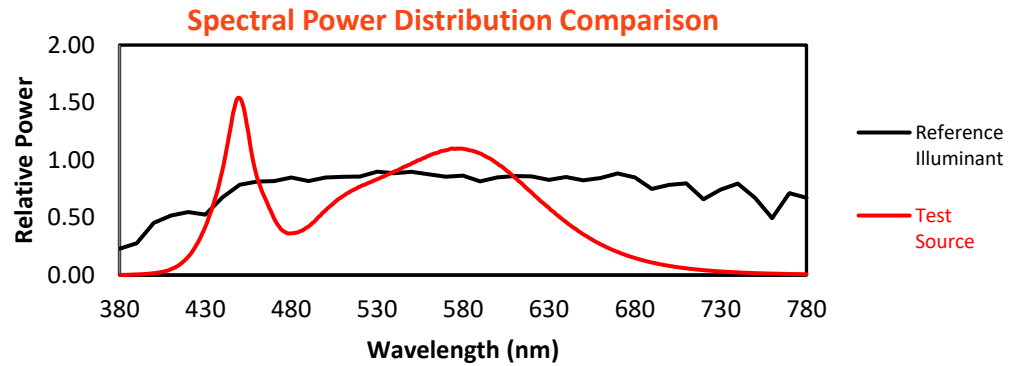
| λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) |
|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|
| 360    | 0                        | NR            | 490    | 274                      | NR            | 620    | 466                      | NR            | 750    | 11                       | NR            | 880    | 0                        | NR            |
| 365    | 0                        | NR            | 495    | 319                      | NR            | 625    | 420                      | NR            | 755    | 10                       | NR            | 885    | 0                        | NR            |
| 370    | 0                        | NR            | 500    | 366                      | NR            | 630    | 380                      | NR            | 760    | 8                        | NR            | 890    | 0                        | NR            |
| 375    | 0                        | NR            | 505    | 409                      | NR            | 635    | 338                      | NR            | 765    | 7                        | NR            | 895    | 0                        | NR            |
| 380    | 0                        | NR            | 510    | 445                      | NR            | 640    | 300                      | NR            | 770    | 6                        | NR            | 900    | 0                        | NR            |
| 385    | 2                        | NR            | 515    | 475                      | NR            | 645    | 264                      | NR            | 775    | 5                        | NR            | 905    | 0                        | NR            |
| 390    | 4                        | NR            | 520    | 499                      | NR            | 650    | 230                      | NR            | 780    | 5                        | NR            | 910    | 0                        | NR            |
| 395    | 6                        | NR            | 525    | 520                      | NR            | 655    | 201                      | NR            | 785    | 4                        | NR            | 915    | 0                        | NR            |
| 400    | 10                       | NR            | 530    | 542                      | NR            | 660    | 174                      | NR            | 790    | 3                        | NR            | 920    | 0                        | NR            |
| 405    | 18                       | NR            | 535    | 562                      | NR            | 665    | 151                      | NR            | 795    | 3                        | NR            | 925    | 0                        | NR            |
| 410    | 33                       | NR            | 540    | 584                      | NR            | 670    | 131                      | NR            | 800    | 3                        | NR            | 930    | 0                        | NR            |
| 415    | 59                       | NR            | 545    | 607                      | NR            | 675    | 112                      | NR            | 805    | 2                        | NR            | 935    | 0                        | NR            |
| 420    | 103                      | NR            | 550    | 629                      | NR            | 680    | 97                       | NR            | 810    | 2                        | NR            | 940    | 0                        | NR            |
| 425    | 173                      | NR            | 555    | 650                      | NR            | 685    | 83                       | NR            | 815    | 2                        | NR            | 945    | 0                        | NR            |
| 430    | 274                      | NR            | 560    | 673                      | NR            | 690    | 71                       | NR            | 820    | 2                        | NR            | 950    | 0                        | NR            |
| 435    | 412                      | NR            | 565    | 690                      | NR            | 695    | 61                       | NR            | 825    | 1                        | NR            | 955    | 0                        | NR            |
| 440    | 595                      | NR            | 570    | 705                      | NR            | 700    | 52                       | NR            | 830    | 1                        | NR            | 960    | 0                        | NR            |
| 445    | 849                      | NR            | 575    | 712                      | NR            | 705    | 44                       | NR            | 835    | 1                        | NR            | 965    | 0                        | NR            |
| 450    | 999                      | NR            | 580    | 713                      | NR            | 710    | 38                       | NR            | 840    | 1                        | NR            | 970    | 0                        | NR            |
| 455    | 805                      | NR            | 585    | 703                      | NR            | 715    | 33                       | NR            | 845    | 1                        | NR            | 975    | 0                        | NR            |
| 460    | 555                      | NR            | 590    | 686                      | NR            | 720    | 28                       | NR            | 850    | 1                        | NR            | 980    | 0                        | NR            |
| 465    | 428                      | NR            | 595    | 661                      | NR            | 725    | 24                       | NR            | 855    | 1                        | NR            | 985    | 0                        | NR            |
| 470    | 319                      | NR            | 600    | 630                      | NR            | 730    | 20                       | NR            | 860    | 1                        | NR            | 990    | 0                        | NR            |
| 475    | 251                      | NR            | 605    | 593                      | NR            | 735    | 18                       | NR            | 865    | 1                        | NR            | 995    | 0                        | NR            |
| 480    | 236                      | NR            | 610    | 552                      | NR            | 740    | 15                       | NR            | 870    | 0                        | NR            | 1000   | 0                        | NR            |
| 485    | 247                      | NR            | 615    | 510                      | NR            | 745    | 13                       | NR            | 875    | 0                        | NR            |        |                          |               |

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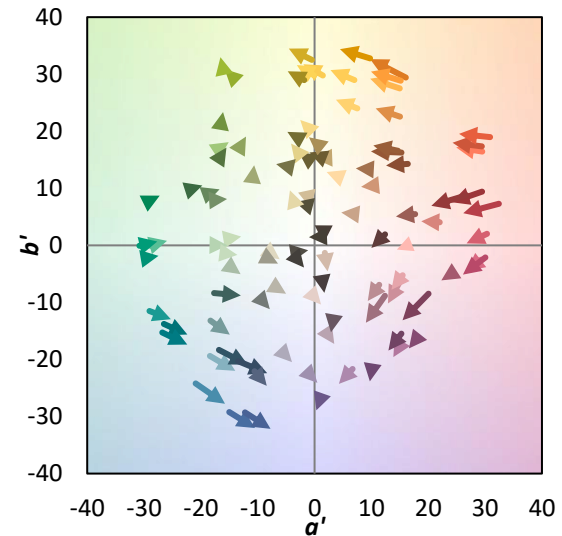
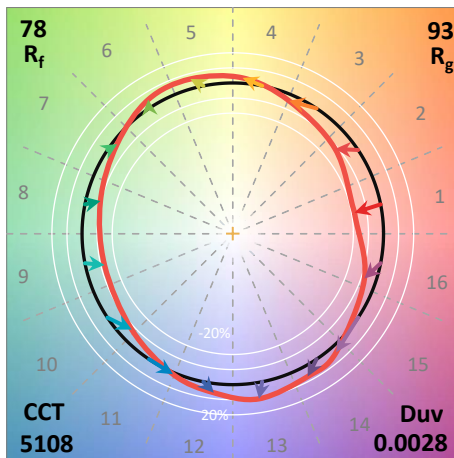
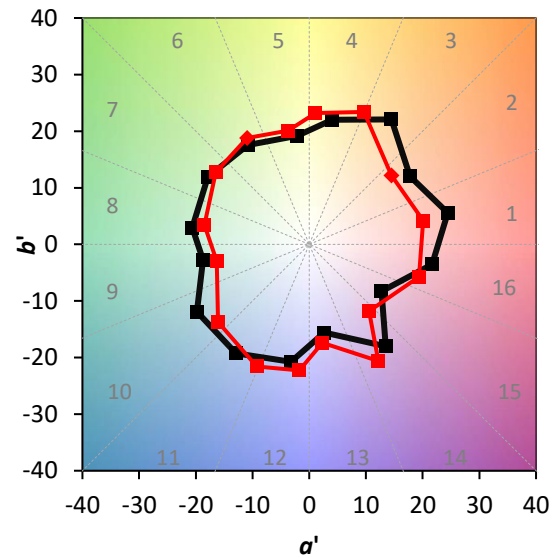
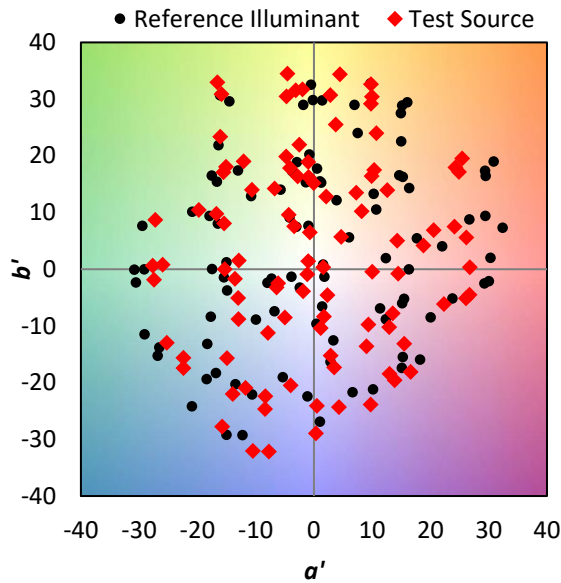
TM-30-18

### Summary

$R_f = 77.8$   
 $R_g = 93.2$   
 $\text{CIE } R_a = 75.3$   
 $R_g = -33.6$

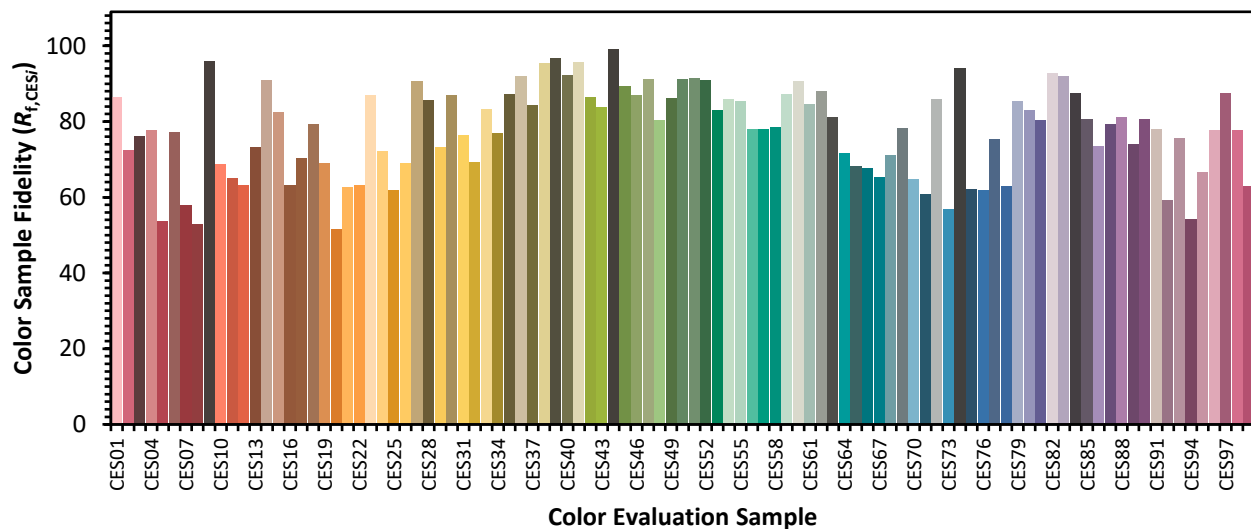


### Color Vector Graphics

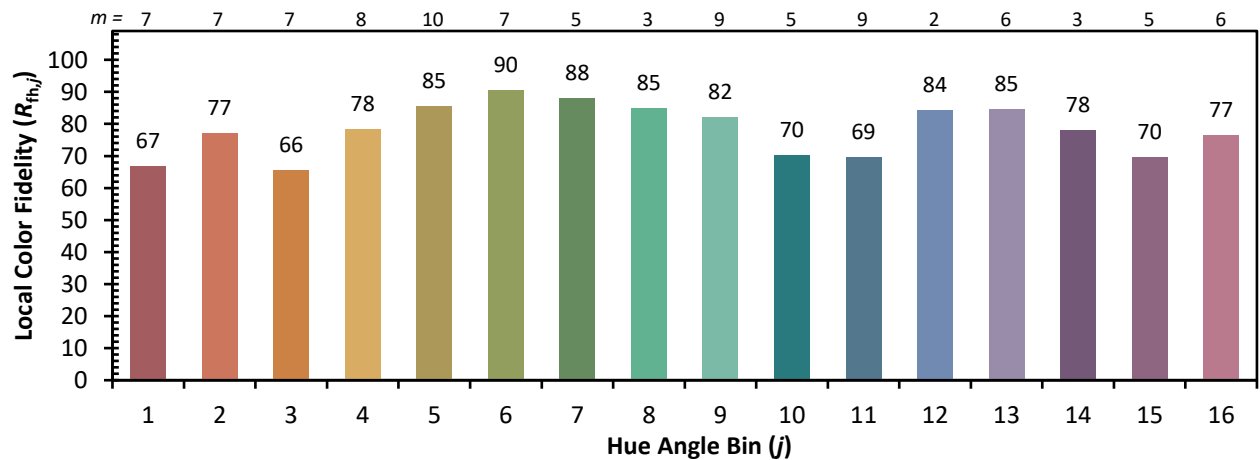
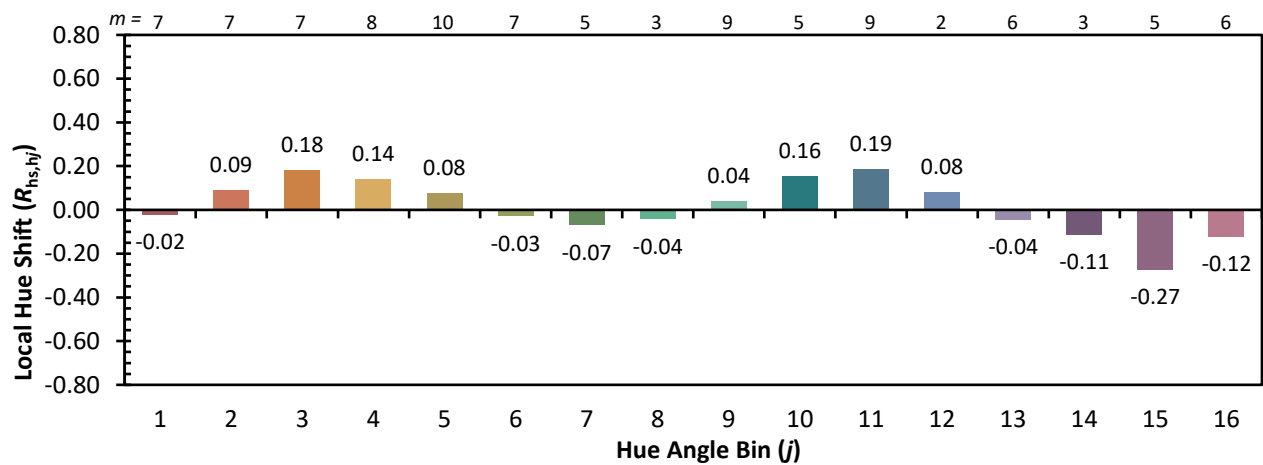
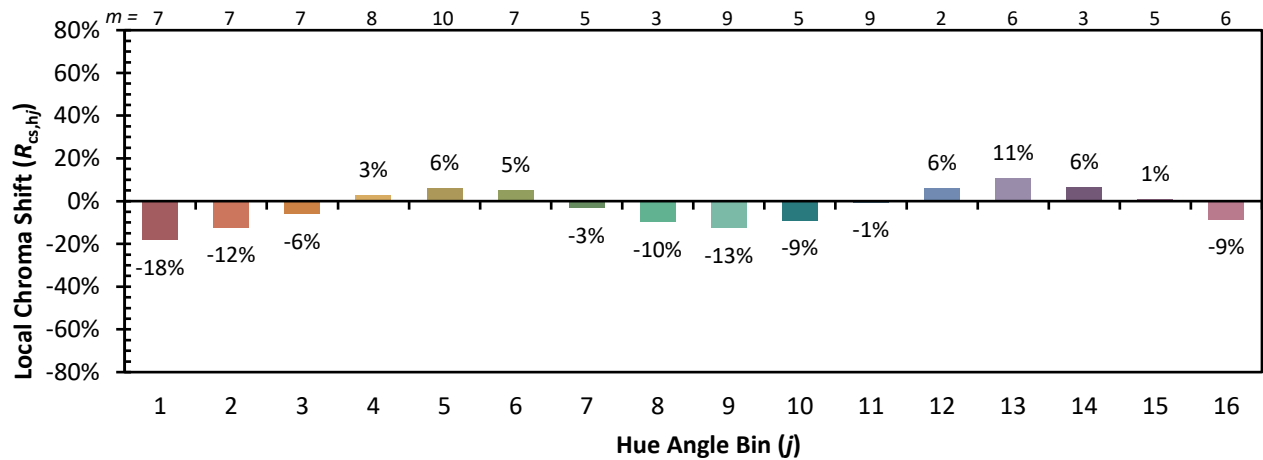


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

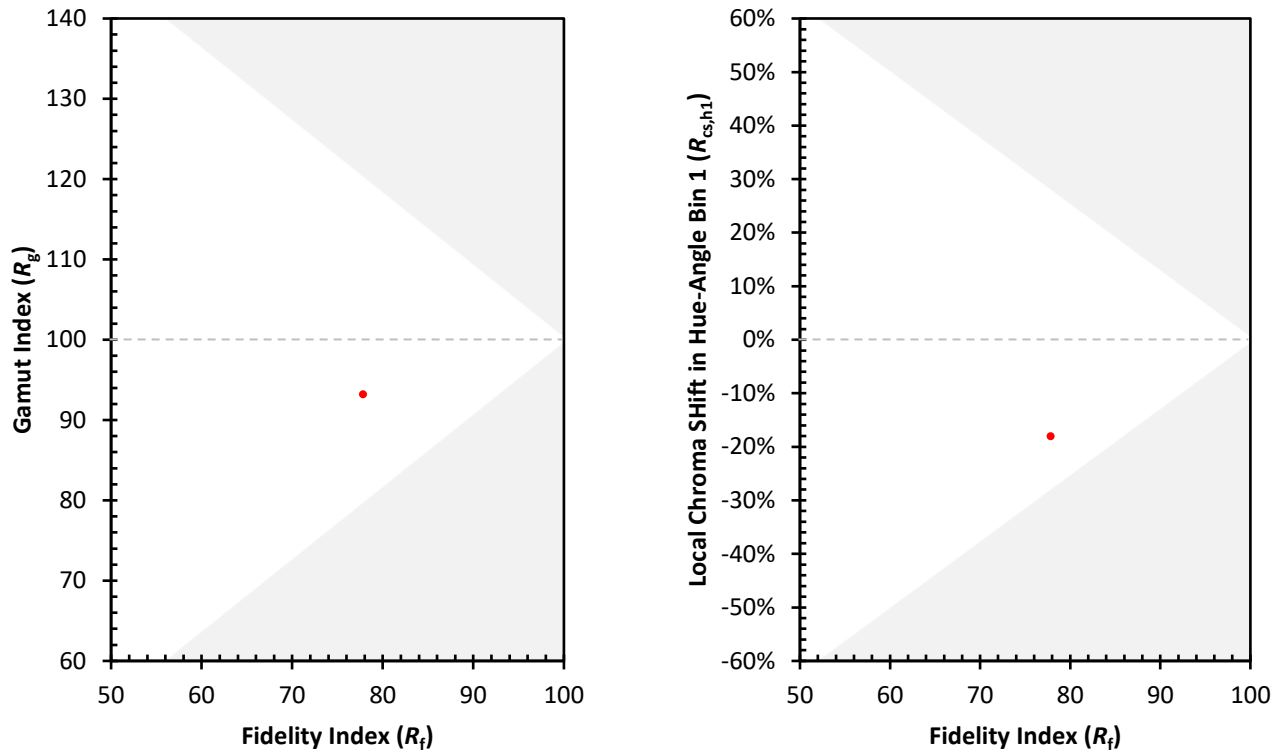
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 69 | CES51 = 92 | CES76 = 62 |
| CES02 = 60 | CES27 = 91 | CES52 = 91 | CES77 = 75 |
| CES03 = 30 | CES28 = 86 | CES53 = 83 | CES78 = 63 |
| CES04 = 69 | CES29 = 73 | CES54 = 86 | CES79 = 85 |
| CES05 = 46 | CES30 = 87 | CES55 = 85 | CES80 = 83 |
| CES06 = 50 | CES31 = 76 | CES56 = 78 | CES81 = 80 |
| CES07 = 39 | CES32 = 69 | CES57 = 78 | CES82 = 93 |
| CES08 = 38 | CES33 = 83 | CES58 = 78 | CES83 = 92 |
| CES09 = 29 | CES34 = 77 | CES59 = 87 | CES84 = 88 |
| CES10 = 73 | CES35 = 87 | CES60 = 91 | CES85 = 81 |
| CES11 = 56 | CES36 = 92 | CES61 = 85 | CES86 = 74 |
| CES12 = 61 | CES37 = 84 | CES62 = 88 | CES87 = 79 |
| CES13 = 41 | CES38 = 95 | CES63 = 81 | CES88 = 81 |
| CES14 = 74 | CES39 = 97 | CES64 = 72 | CES89 = 74 |
| CES15 = 70 | CES40 = 92 | CES65 = 68 | CES90 = 81 |
| CES16 = 46 | CES41 = 96 | CES66 = 68 | CES91 = 78 |
| CES17 = 49 | CES42 = 87 | CES67 = 65 | CES92 = 59 |
| CES18 = 55 | CES43 = 84 | CES68 = 71 | CES93 = 76 |
| CES19 = 71 | CES44 = 99 | CES69 = 78 | CES94 = 54 |
| CES20 = 64 | CES45 = 89 | CES70 = 65 | CES95 = 67 |
| CES21 = 85 | CES46 = 87 | CES71 = 61 | CES96 = 78 |
| CES22 = 77 | CES47 = 91 | CES72 = 86 | CES97 = 88 |
| CES23 = 91 | CES48 = 80 | CES73 = 57 | CES98 = 78 |
| CES24 = 90 | CES49 = 86 | CES74 = 94 | CES99 = 63 |
| CES25 = 71 | CES50 = 91 | CES75 = 62 |            |



Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)