

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: P980829

Luminaire Tested: **UFLD-L-CA4-270-740-U-66**

Issue Date: 04/10/2025

**Test Information**

Test Method: LM-79-08  
Report Number: P980829  
Test Lab: INNOVATION CENTER(G2)  
Issue Date: 04/10/2025  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: STREETWORKS  
Catalog Number: UFLD-L-CA4-270-740-U-66  
Description: UTILITY FLOOD LARGE SIZE 270W 70CRI 4000K LED FIXTURE NEMA 6  
Light Source: (4) 4000K CCT, 70 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 43739.1 lumens  
Efficiency: N/A  
Efficacy: 160.0 lumens/watt  
Luminous Opening: Rectangular (W 1' x L: 0.67' x H: 0')  
IES Classification: Type I - Short  
BUG Rating: B5 - U0 - G2

Input Watts (W): 273.3  
Input Voltage (V): 120  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.99  
Total Harmonic Distortion (THDi): 3.49%  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 28.75 FT

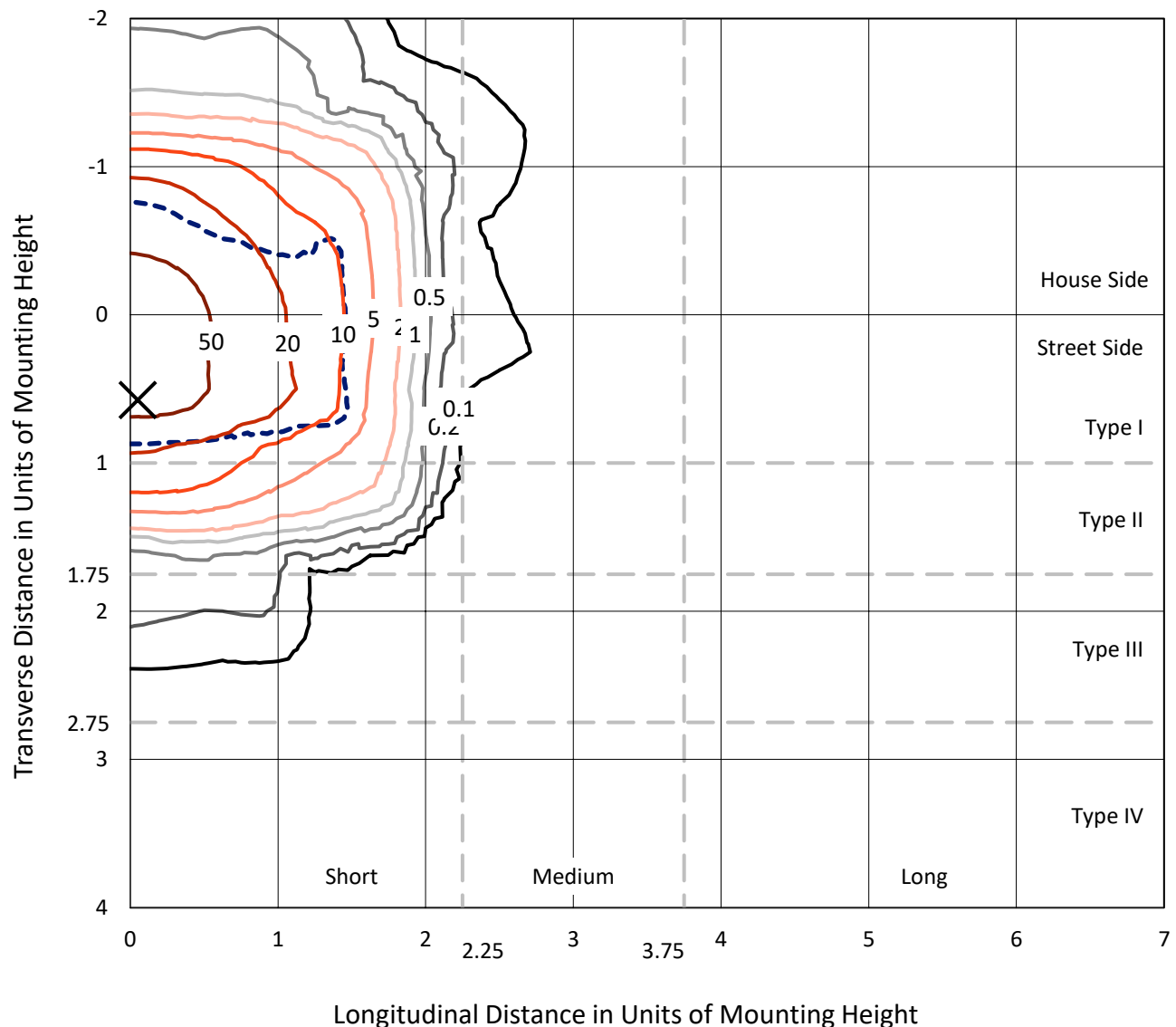


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## Iso-Footcandle Lines of Horizontal Illumination

× Max cd  
 - - - 1/2 Max cd

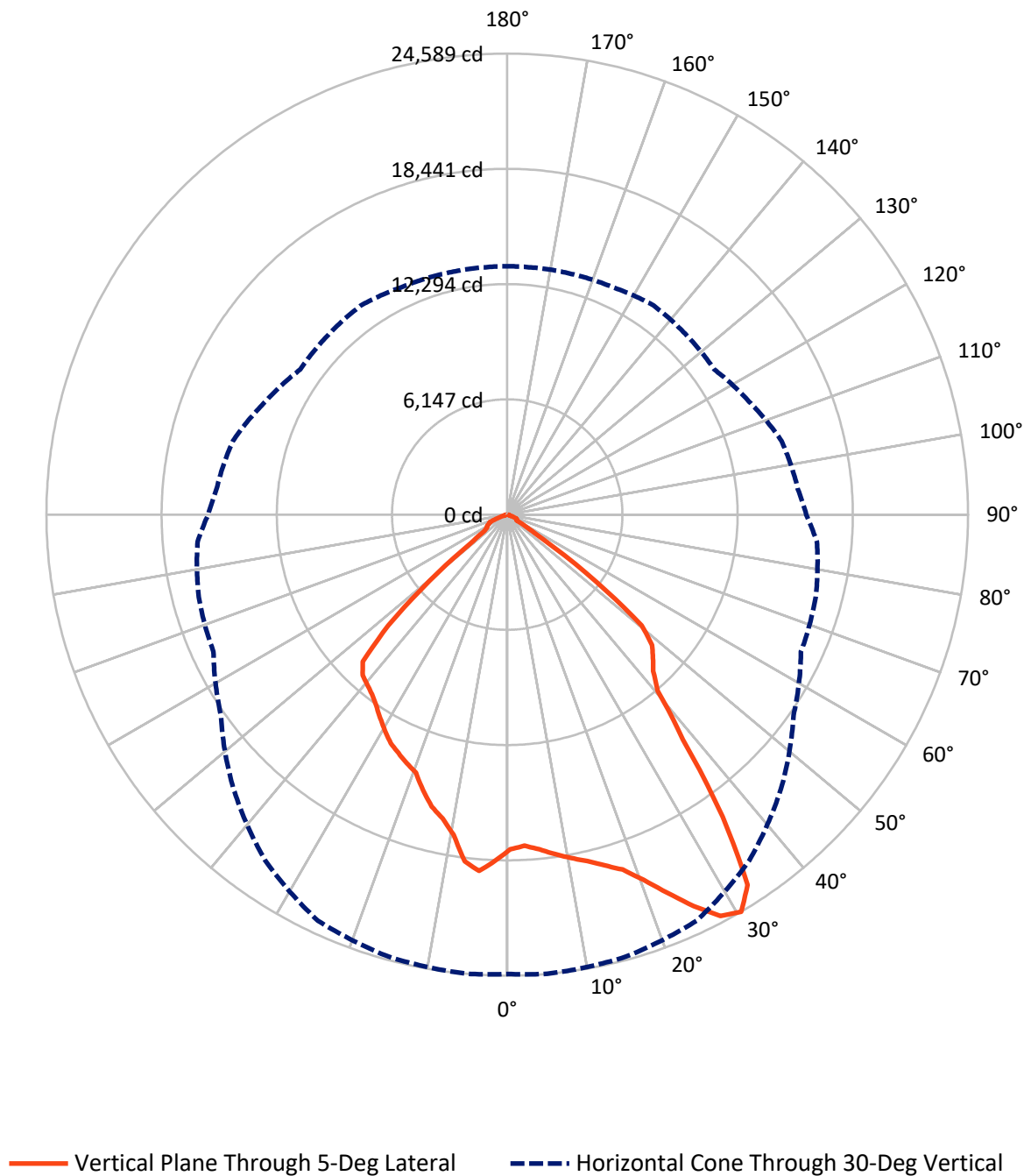


Based on 15 foot mounting height. Maximum calculated value = 81.3 fc

Type I - Short - N/A

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## Luminous Intensity Polar Plot



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CATALOG NUMBER: UFLD-L-CA4-270-740-U-66

**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 19345.4  | 0.0    | 19345.4 |
|                    | % Fixture | 44.2     | 0.0    | 44.2    |
| <b>Street Side</b> | Lumens    | 24393.7  | 0.0    | 24393.7 |
|                    | % Fixture | 55.8     | 0.0    | 55.8    |
| <b>Total</b>       | Lumens    | 43739.1  | 0.0    | 43739.1 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**Coefficient of Utilization**

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 1746.4  | 4.0       |
| 10°-20°   | 5059.1  | 11.6      |
| 20°-30°   | 8062.1  | 18.4      |
| 30°-40°   | 10078.9 | 23.0      |
| 40°-50°   | 9890.8  | 22.6      |
| 50°-60°   | 7071.4  | 16.2      |
| 60°-70°   | 1564.5  | 3.6       |
| 70°-80°   | 240.3   | 0.5       |
| 80°-90°   | 25.4    | 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°    | 43739.1 | 100.0     |
| 0°-180°   | 43739.1 | 100.0     |



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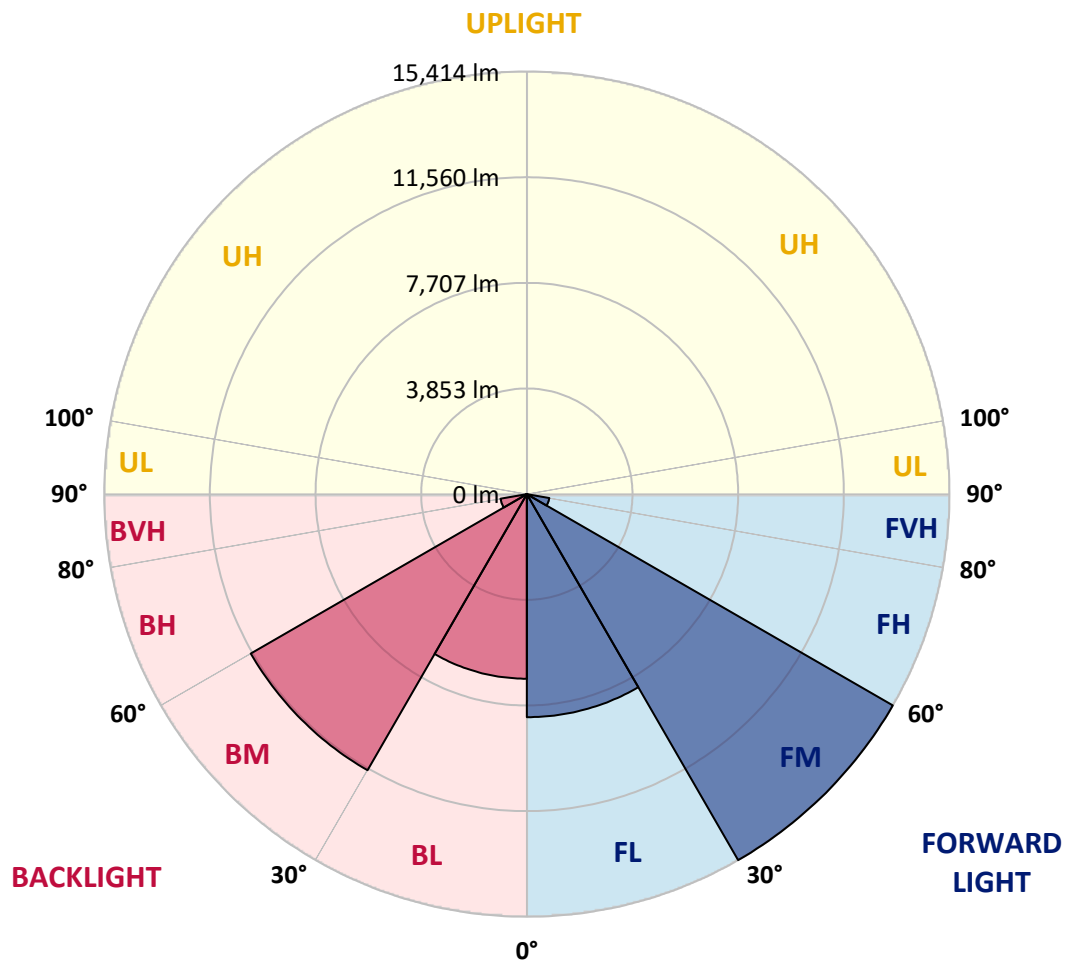
CATALOG NUMBER: UFLD-L-CA4-270-740-U-66

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

| Zone |             | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|---------|-----------|-------------------------|------|---------|
|      |             |         |           | B                       | U    | G       |
| FL   | (0°-30°)    | 8135.1  | 18.6      |                         |      |         |
| FM   | (30°-60°)   | 15413.6 | 35.2      |                         |      |         |
| FH   | (60°-80°)   | 832.2   | 1.9       |                         |      | G1/1800 |
| FVH  | (80°-90°)   | 12.8    | 0.0       |                         |      | G1/100  |
| BL   | (0°-30°)    | 6732.6  | 15.4      | B5                      |      |         |
| BM   | (30°-60°)   | 11627.5 | 26.6      | B5                      |      |         |
| BH   | (60°-80°)   | 972.7   | 2.2       | B2/1000                 |      | G2/1000 |
| BVH  | (80°-90°)   | 12.6    | 0.0       |                         |      | G1/100  |
| UL   | (90°-100°)  | 0.0     | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0     | 0.0       |                         | U0/0 |         |

**BUG Rating: B5-U0-G2**

Type I Short



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 45°     | 55°     | 65°     | 75°     | 85°     | 90°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 17852.8 | 17852.8 | 17852.8 | 17852.8 | 17852.8 | 17852.8 | 17852.8 | 17852.8 | 17852.8 | 17852.8 | 17852.8 |
| 2.5°  | 17653.0 | 17681.5 | 17710.1 | 17752.9 | 17810.0 | 17838.5 | 17810.0 | 17781.4 | 17767.1 | 17795.7 | 17810.0 |
| 5°    | 17895.6 | 17938.4 | 17952.7 | 17981.2 | 18009.7 | 17981.2 | 17966.9 | 17938.4 | 17924.1 | 17938.4 | 17981.2 |
| 7.5°  | 18252.4 | 18280.9 | 18266.6 | 18252.4 | 18238.1 | 18138.2 | 18038.3 | 17995.5 | 17995.5 | 18038.3 | 18152.5 |
| 10°   | 18566.3 | 18623.4 | 18552.0 | 18495.0 | 18395.1 | 18238.1 | 18066.8 | 17966.9 | 17995.5 | 18081.1 | 18223.8 |
| 12.5° | 18965.9 | 18965.9 | 18894.5 | 18837.5 | 18609.1 | 18423.6 | 18195.3 | 18038.3 | 18038.3 | 18195.3 | 18352.2 |
| 15°   | 19451.1 | 19408.3 | 19379.7 | 19222.8 | 18951.6 | 18651.9 | 18366.5 | 18138.2 | 18095.4 | 18338.0 | 18437.9 |
| 17.5° | 20064.7 | 19907.8 | 19836.4 | 19565.3 | 19194.2 | 18808.9 | 18423.6 | 18238.1 | 18109.6 | 18366.5 | 18252.4 |
| 20°   | 20906.7 | 20792.6 | 20564.2 | 20136.1 | 19379.7 | 18880.3 | 18423.6 | 18181.0 | 18081.1 | 18223.8 | 18109.6 |
| 22.5° | 21991.3 | 21919.9 | 21406.2 | 20863.9 | 19865.0 | 18937.4 | 18352.2 | 18024.0 | 17995.5 | 17924.1 | 17681.5 |
| 25°   | 23318.5 | 23133.0 | 22604.9 | 21834.3 | 20592.8 | 19493.9 | 18338.0 | 17738.6 | 17638.7 | 17453.2 | 17025.1 |
| 27.5° | 24445.9 | 24246.1 | 23603.9 | 22918.9 | 21591.7 | 20321.6 | 18452.1 | 17396.1 | 17281.9 | 17153.5 | 16625.5 |
| 30°   | 24503.0 | 24588.6 | 24417.3 | 23903.6 | 22519.3 | 20664.1 | 18651.9 | 17296.2 | 17039.3 | 16582.7 | 15954.8 |
| 32.5° | 23347.0 | 23546.8 | 23960.7 | 24146.2 | 23218.6 | 21078.0 | 18823.2 | 17339.0 | 16868.1 | 15769.2 | 15255.5 |
| 35°   | 19394.0 | 19793.6 | 21491.8 | 23090.2 | 23418.4 | 21677.3 | 18965.9 | 17339.0 | 16811.0 | 15184.1 | 14784.5 |
| 37.5° | 14898.7 | 15226.9 | 16668.3 | 19565.3 | 22533.6 | 22048.4 | 19279.8 | 17239.1 | 16739.6 | 15226.9 | 14684.7 |
| 40°   | 12173.0 | 12358.5 | 12986.4 | 14955.8 | 19422.6 | 21434.7 | 19593.8 | 17353.3 | 16525.6 | 15255.5 | 14741.7 |
| 42.5° | 11430.9 | 11416.6 | 11288.2 | 12016.0 | 14813.1 | 19636.6 | 19807.9 | 17638.7 | 16168.8 | 15070.0 | 14641.8 |
| 45°   | 10931.4 | 10902.9 | 10788.7 | 10931.4 | 11716.3 | 16068.9 | 19650.9 | 18152.5 | 15726.4 | 14413.5 | 14128.1 |
| 47.5° | 10389.1 | 10403.4 | 10360.6 | 10417.7 | 10275.0 | 12201.5 | 18766.1 | 18366.5 | 14970.1 | 13314.7 | 13214.8 |
| 50°   | 9090.5  | 9304.6  | 9875.4  | 9932.5  | 9561.4  | 9846.9  | 16068.9 | 18266.6 | 14427.8 | 13000.7 | 12915.1 |
| 52.5° | 5651.2  | 5993.7  | 7677.7  | 9104.8  | 8890.7  | 8890.7  | 12258.6 | 18409.3 | 13457.4 | 12886.5 | 12943.6 |
| 55°   | 1997.9  | 2254.8  | 4110.0  | 6264.9  | 7963.1  | 8120.1  | 9689.9  | 16382.9 | 13343.2 | 13086.3 | 13143.4 |
| 57.5° | 499.5   | 613.6   | 1255.8  | 2711.5  | 5365.8  | 7363.7  | 8662.4  | 13528.7 | 10132.3 | 9775.5  | 9918.2  |
| 60°   | 585.1   | 570.8   | 784.9   | 870.5   | 2083.5  | 5822.5  | 7806.1  | 9133.3  | 6536.0  | 6122.2  | 6193.5  |
| 62.5° | 627.9   | 585.1   | 613.6   | 770.6   | 342.5   | 2854.2  | 6222.1  | 5437.2  | 2697.2  | 1997.9  | 2112.1  |
| 65°   | 556.6   | 528.0   | 485.2   | 713.5   | 242.6   | 528.0   | 3667.6  | 1598.3  | 385.3   | 613.6   | 556.6   |
| 67.5° | 371.0   | 385.3   | 399.6   | 570.8   | 228.3   | 228.3   | 485.2   | 399.6   | 271.1   | 556.6   | 485.2   |
| 70°   | 214.1   | 228.3   | 271.1   | 342.5   | 228.3   | 185.5   | 214.1   | 328.2   | 228.3   | 556.6   | 485.2   |
| 72.5° | 128.4   | 128.4   | 128.4   | 142.7   | 228.3   | 157.0   | 142.7   | 271.1   | 199.8   | 513.7   | 485.2   |
| 75°   | 99.9    | 99.9    | 99.9    | 85.6    | 199.8   | 99.9    | 99.9    | 214.1   | 171.2   | 371.0   | 371.0   |
| 77.5° | 85.6    | 85.6    | 85.6    | 71.4    | 114.2   | 85.6    | 85.6    | 157.0   | 157.0   | 185.5   | 214.1   |
| 80°   | 57.1    | 57.1    | 57.1    | 57.1    | 71.4    | 71.4    | 57.1    | 85.6    | 71.4    | 85.6    | 99.9    |
| 82.5° | 28.5    | 42.8    | 42.8    | 28.5    | 42.8    | 42.8    | 42.8    | 57.1    | 42.8    | 57.1    | 57.1    |
| 85°   | 14.3    | 14.3    | 14.3    | 14.3    | 14.3    | 14.3    | 14.3    | 28.5    | 14.3    | 14.3    | 28.5    |
| 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-L-CA4-270-740-U-66

**CANDELA DISTRIBUTION (continued):**

|       | 95°     | 105°    | 115°    | 125°    | 135°    | 145°    | 155°    | 165°    | 175°    | 180°    |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 17852.8 | 17852.8 | 17852.8 | 17852.8 | 17852.8 | 17852.8 | 17852.8 | 17852.8 | 17852.8 | 17852.8 |
| 2.5°  | 17838.5 | 17909.9 | 18009.7 | 18166.7 | 18223.8 | 18323.7 | 18409.3 | 18480.7 | 18480.7 | 18452.1 |
| 5°    | 18066.8 | 18266.6 | 18537.8 | 18780.4 | 18866.0 | 18965.9 | 19008.7 | 19080.1 | 19065.8 | 19051.5 |
| 7.5°  | 18266.6 | 18580.6 | 18866.0 | 19037.2 | 19008.7 | 18880.3 | 18794.6 | 18680.5 | 18637.7 | 18666.2 |
| 10°   | 18423.6 | 18709.0 | 18837.5 | 18723.3 | 18380.8 | 18081.1 | 17695.8 | 17438.9 | 17310.5 | 17353.3 |
| 12.5° | 18480.7 | 18580.6 | 18466.4 | 17838.5 | 17410.4 | 17125.0 | 16811.0 | 16639.8 | 16568.4 | 16582.7 |
| 15°   | 18495.0 | 18266.6 | 17638.7 | 17167.8 | 16853.8 | 16497.0 | 16240.2 | 16083.2 | 16083.2 | 16097.5 |
| 17.5° | 18195.3 | 17638.7 | 17096.4 | 16739.6 | 16297.3 | 15926.2 | 15783.5 | 15726.4 | 15369.7 | 15426.7 |
| 20°   | 17924.1 | 17125.0 | 16825.3 | 16268.7 | 15740.7 | 15498.1 | 14670.4 | 14584.8 | 14599.0 | 14613.3 |
| 22.5° | 17353.3 | 16753.9 | 16482.8 | 15755.0 | 15155.6 | 14484.9 | 14370.7 | 14285.1 | 14299.3 | 14299.3 |
| 25°   | 16568.4 | 16225.9 | 15854.9 | 15098.5 | 14370.7 | 14242.3 | 14156.6 | 14042.5 | 13985.4 | 13999.7 |
| 27.5° | 16126.0 | 15697.9 | 15012.9 | 14370.7 | 13899.8 | 13956.8 | 13856.9 | 13685.7 | 13685.7 | 13700.0 |
| 30°   | 15569.4 | 15155.6 | 14242.3 | 13485.9 | 13528.7 | 13614.3 | 13371.7 | 13286.1 | 13243.3 | 13243.3 |
| 32.5° | 14884.4 | 14313.6 | 13514.4 | 12800.9 | 13057.8 | 13029.2 | 12729.6 | 12758.1 | 12786.6 | 12758.1 |
| 35°   | 14370.7 | 13628.6 | 12957.9 | 12572.6 | 12472.7 | 12358.5 | 12201.5 | 12301.4 | 12344.2 | 12315.7 |
| 37.5° | 14242.3 | 13357.5 | 12658.2 | 12387.1 | 12001.7 | 11787.7 | 11830.5 | 11930.4 | 11987.5 | 11973.2 |
| 40°   | 14199.4 | 13086.3 | 12401.3 | 12115.9 | 11602.2 | 11416.6 | 11473.7 | 11673.5 | 11744.9 | 11730.6 |
| 42.5° | 14142.4 | 12900.8 | 12244.3 | 11901.8 | 11188.3 | 11059.9 | 11331.0 | 11516.5 | 11530.8 | 11516.5 |
| 45°   | 13842.7 | 12701.0 | 12144.5 | 11459.5 | 10560.4 | 10717.4 | 11059.9 | 11159.8 | 10988.5 | 10917.2 |
| 47.5° | 13143.4 | 12330.0 | 11844.8 | 10917.2 | 10046.6 | 10346.3 | 10389.1 | 9304.6  | 8676.6  | 8533.9  |
| 50°   | 12943.6 | 12344.2 | 11502.3 | 10275.0 | 9732.7  | 10032.4 | 8162.9  | 6236.3  | 5451.4  | 5294.5  |
| 52.5° | 12886.5 | 12201.5 | 11630.7 | 9604.2  | 9618.5  | 8462.6  | 5151.8  | 3054.0  | 2454.6  | 2340.4  |
| 55°   | 13029.2 | 12829.4 | 11844.8 | 9204.7  | 8947.8  | 5508.5  | 2397.5  | 1441.4  | 1484.2  | 1441.4  |
| 57.5° | 9832.6  | 10731.6 | 12101.6 | 8576.8  | 6536.0  | 2654.4  | 1512.7  | 1398.5  | 1298.6  | 1270.1  |
| 60°   | 6136.4  | 6992.7  | 8862.2  | 7378.0  | 3353.6  | 1584.1  | 1541.2  | 1298.6  | 1255.8  | 1241.6  |
| 62.5° | 2026.5  | 3111.0  | 5080.4  | 4852.1  | 927.6   | 1569.8  | 1555.5  | 1155.9  | 1155.9  | 1155.9  |
| 65°   | 513.7   | 528.0   | 1398.5  | 1669.7  | 685.0   | 1398.5  | 1484.2  | 1084.6  | 1056.0  | 1098.9  |
| 67.5° | 442.4   | 399.6   | 742.1   | 656.5   | 570.8   | 970.4   | 1298.6  | 1041.8  | 984.7   | 984.7   |
| 70°   | 442.4   | 470.9   | 727.8   | 613.6   | 356.8   | 528.0   | 941.9   | 642.2   | 570.8   | 528.0   |
| 72.5° | 413.9   | 456.7   | 642.2   | 556.6   | 242.6   | 256.9   | 413.9   | 214.1   | 199.8   | 171.2   |
| 75°   | 356.8   | 371.0   | 499.5   | 499.5   | 256.9   | 128.4   | 171.2   | 142.7   | 142.7   | 128.4   |
| 77.5° | 242.6   | 185.5   | 285.4   | 356.8   | 185.5   | 85.6    | 71.4    | 71.4    | 71.4    | 57.1    |
| 80°   | 128.4   | 71.4    | 71.4    | 57.1    | 71.4    | 71.4    | 42.8    | 57.1    | 57.1    | 42.8    |
| 82.5° | 71.4    | 42.8    | 42.8    | 28.5    | 28.5    | 42.8    | 28.5    | 28.5    | 28.5    | 28.5    |
| 85°   | 28.5    | 28.5    | 14.3    | 14.3    | 14.3    | 28.5    | 14.3    | 14.3    | 14.3    | 14.3    |
| 87.5° | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 14.3    | 14.3    |
| 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: SP1-2501-319-13

Test Date: 02/05/2025

Luminaire Tested: NFFLD-C55-7040-66

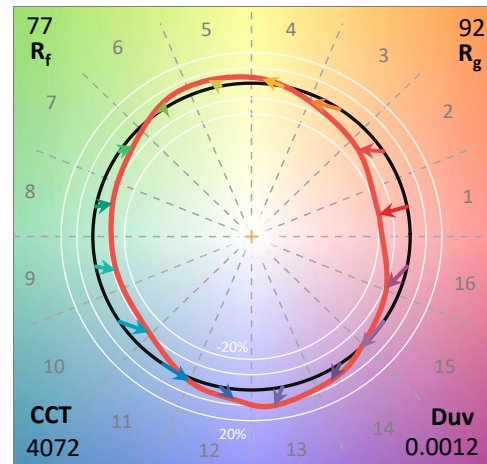
Data in this report applies to families of products including NFFLD-C55-7040-66

### Test Information

Test Method: LM-79-2019  
 Report Number: SP1-2501-319-13  
 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-C55-7040-66**  
 Description: LUMARK NIGHT FALCON 16900LM NEMA 6

### Spectral Parameters

|                           |          |           |      |      |       |
|---------------------------|----------|-----------|------|------|-------|
| CCT (K):                  | 4072     | CRI (Ra): | 73.2 |      |       |
| CIE u':                   | 0.2232   | R1:       | 68.7 | R9:  | -38.7 |
| CIE v':                   | 0.5017   | R2:       | 82.1 | R10: | 58.6  |
| Duv:                      | 0.0012   | R3:       | 92.3 | R11: | 65.6  |
| CIE x:                    | 0.3781   | R4:       | 69.9 | R12: | 52.4  |
| CIE y:                    | 0.3777   | R5:       | 69.8 | R13: | 71.5  |
| CIE z:                    | 0.2442   | R6:       | 75.1 | R14: | 95.9  |
| Peak Wavelength (nm):     | 582      | R7:       | 79.8 | R15: | 60.5  |
| Dominant Wavelength (nm): | 578      | R8:       | 47.9 |      |       |
| Purity:                   | 26.82001 |           |      |      |       |
| Rf:                       | 76.8     |           |      |      |       |
| Rg:                       | 91.7     |           |      |      |       |



### Test Conditions

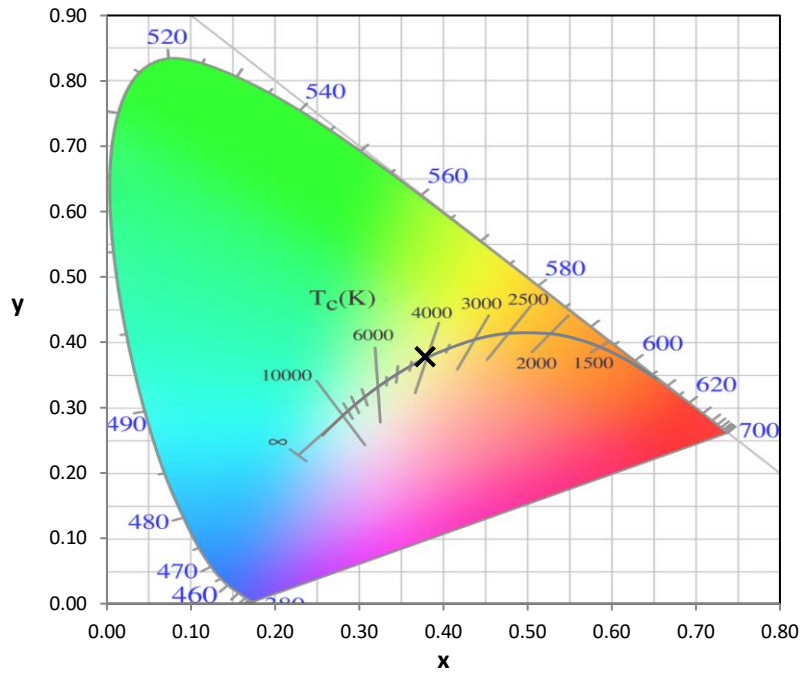
Stabilization Time: 38M  
 Operation Time: 1H 38M  
 Sphere Temperature (°C): 25.0

REPORT NUMBER: SP1-2501-319-13

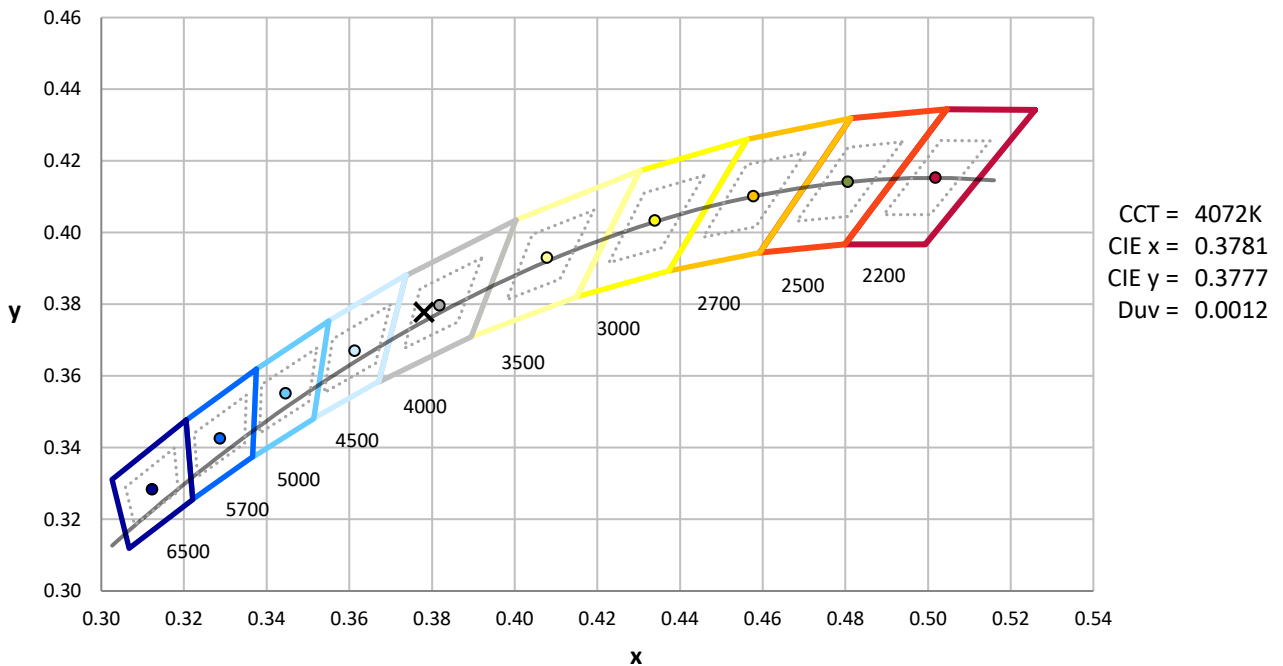
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| 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: SP1-2501-319-13

**CIE 1931 Chromaticity Diagram**



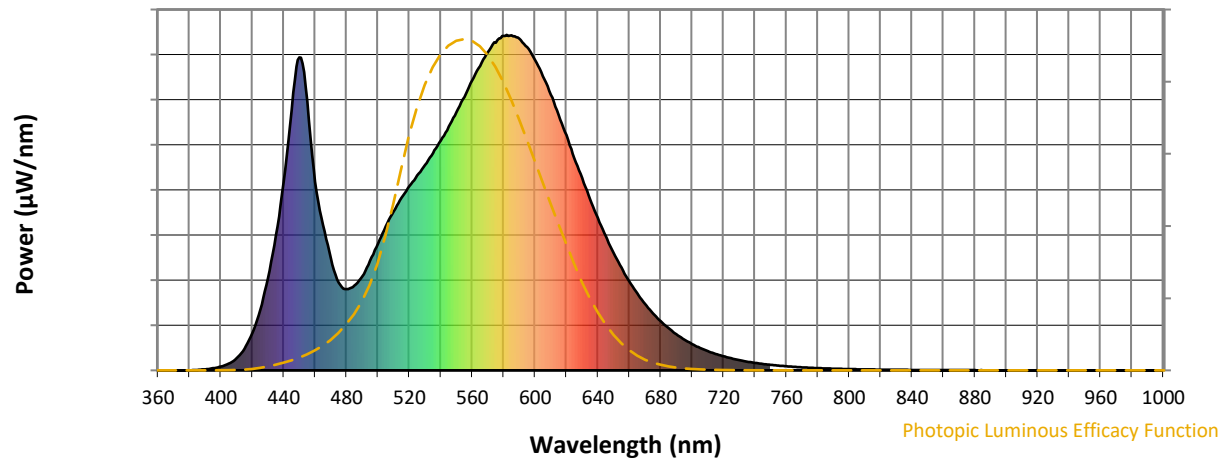
**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 4000K 4-step quadrangle

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### Photopic Flux vs. Wavelength

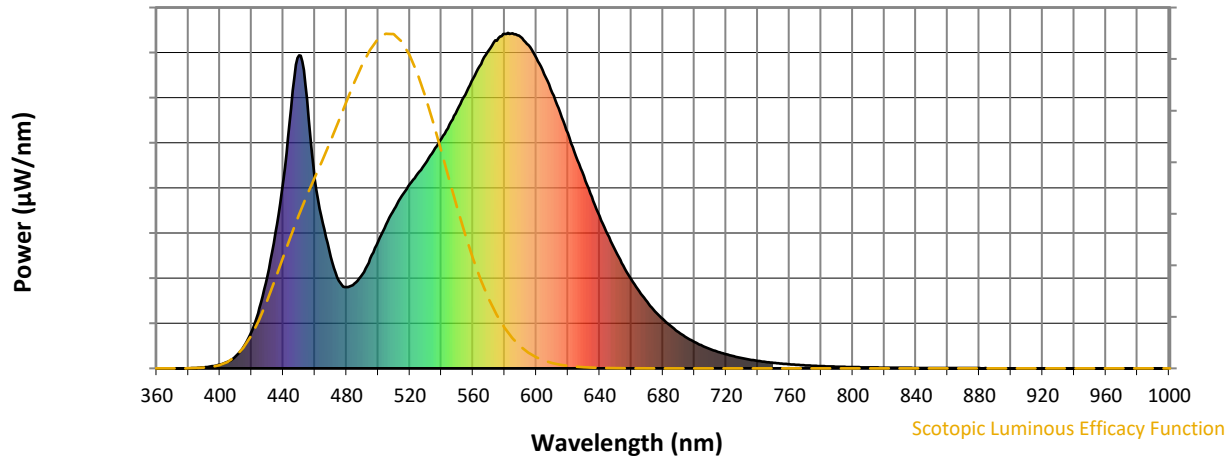


### Photopic Lumens: NR

| $\lambda$<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               | 280                                  | NR                             | 620               | 701                                  | NR                             | 750               | 16                                   | NR                             | 880               | 1                                    | NR                             |
| 365               | 0                                    | NR                             | 495               | 327                                  | NR                             | 625               | 633                                  | NR                             | 755               | 14                                   | NR                             | 885               | 0                                    | NR                             |
| 370               | 0                                    | NR                             | 500               | 378                                  | NR                             | 630               | 573                                  | NR                             | 760               | 12                                   | NR                             | 890               | 0                                    | NR                             |
| 375               | 0                                    | NR                             | 505               | 429                                  | NR                             | 635               | 511                                  | NR                             | 765               | 10                                   | NR                             | 895               | 0                                    | NR                             |
| 380               | 0                                    | NR                             | 510               | 474                                  | NR                             | 640               | 454                                  | NR                             | 770               | 9                                    | NR                             | 900               | 0                                    | NR                             |
| 385               | 1                                    | NR                             | 515               | 514                                  | NR                             | 645               | 400                                  | NR                             | 775               | 8                                    | NR                             | 905               | 0                                    | NR                             |
| 390               | 3                                    | NR                             | 520               | 549                                  | NR                             | 650               | 350                                  | NR                             | 780               | 7                                    | NR                             | 910               | 0                                    | NR                             |
| 395               | 6                                    | NR                             | 525               | 581                                  | NR                             | 655               | 306                                  | NR                             | 785               | 6                                    | NR                             | 915               | 0                                    | NR                             |
| 400               | 11                                   | NR                             | 530               | 613                                  | NR                             | 660               | 265                                  | NR                             | 790               | 5                                    | NR                             | 920               | 0                                    | NR                             |
| 405               | 20                                   | NR                             | 535               | 647                                  | NR                             | 665               | 230                                  | NR                             | 795               | 4                                    | NR                             | 925               | 0                                    | NR                             |
| 410               | 37                                   | NR                             | 540               | 685                                  | NR                             | 670               | 198                                  | NR                             | 800               | 4                                    | NR                             | 930               | 0                                    | NR                             |
| 415               | 65                                   | NR                             | 545               | 727                                  | NR                             | 675               | 170                                  | NR                             | 805               | 3                                    | NR                             | 935               | 0                                    | NR                             |
| 420               | 111                                  | NR                             | 550               | 770                                  | NR                             | 680               | 147                                  | NR                             | 810               | 3                                    | NR                             | 940               | 0                                    | NR                             |
| 425               | 180                                  | NR                             | 555               | 815                                  | NR                             | 685               | 126                                  | NR                             | 815               | 3                                    | NR                             | 945               | 0                                    | NR                             |
| 430               | 275                                  | NR                             | 560               | 864                                  | NR                             | 690               | 107                                  | NR                             | 820               | 2                                    | NR                             | 950               | 0                                    | NR                             |
| 435               | 403                                  | NR                             | 565               | 907                                  | NR                             | 695               | 92                                   | NR                             | 825               | 2                                    | NR                             | 955               | 0                                    | NR                             |
| 440               | 562                                  | NR                             | 570               | 948                                  | NR                             | 700               | 78                                   | NR                             | 830               | 2                                    | NR                             | 960               | 0                                    | NR                             |
| 445               | 775                                  | NR                             | 575               | 977                                  | NR                             | 705               | 67                                   | NR                             | 835               | 2                                    | NR                             | 965               | 0                                    | NR                             |
| 450               | 933                                  | NR                             | 580               | 997                                  | NR                             | 710               | 57                                   | NR                             | 840               | 1                                    | NR                             | 970               | 0                                    | NR                             |
| 455               | 801                                  | NR                             | 585               | 999                                  | NR                             | 715               | 49                                   | NR                             | 845               | 1                                    | NR                             | 975               | 0                                    | NR                             |
| 460               | 562                                  | NR                             | 590               | 988                                  | NR                             | 720               | 42                                   | NR                             | 850               | 1                                    | NR                             | 980               | 0                                    | NR                             |
| 465               | 433                                  | NR                             | 595               | 963                                  | NR                             | 725               | 36                                   | NR                             | 855               | 1                                    | NR                             | 985               | 0                                    | NR                             |
| 470               | 332                                  | NR                             | 600               | 925                                  | NR                             | 730               | 31                                   | NR                             | 860               | 1                                    | NR                             | 990               | 0                                    | NR                             |
| 475               | 261                                  | NR                             | 605               | 877                                  | NR                             | 735               | 26                                   | NR                             | 865               | 1                                    | NR                             | 995               | 0                                    | NR                             |
| 480               | 243                                  | NR                             | 610               | 822                                  | NR                             | 740               | 22                                   | NR                             | 870               | 1                                    | NR                             | 1000              | 0                                    | NR                             |
| 485               | 253                                  | NR                             | 615               | 762                                  | NR                             | 745               | 19                                   | NR                             | 875               | 1                                    | NR                             |                   |                                      |                                |

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### Scotopic Flux vs. Wavelength



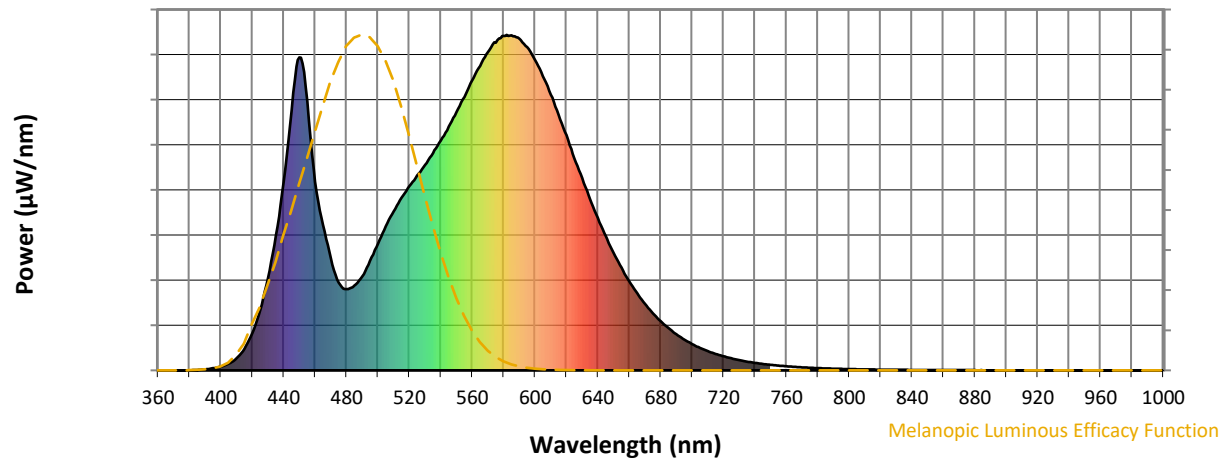
Scotopic Lumens: NR

S/P: 1.6

| $\lambda$<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               | 280                                  | NR                             | 620               | 701                                  | NR                             | 750               | 16                                   | NR                             | 880               | 1                                    | NR                             |
| 365               | 0                                    | NR                             | 495               | 327                                  | NR                             | 625               | 633                                  | NR                             | 755               | 14                                   | NR                             | 885               | 0                                    | NR                             |
| 370               | 0                                    | NR                             | 500               | 378                                  | NR                             | 630               | 573                                  | NR                             | 760               | 12                                   | NR                             | 890               | 0                                    | NR                             |
| 375               | 0                                    | NR                             | 505               | 429                                  | NR                             | 635               | 511                                  | NR                             | 765               | 10                                   | NR                             | 895               | 0                                    | NR                             |
| 380               | 0                                    | NR                             | 510               | 474                                  | NR                             | 640               | 454                                  | NR                             | 770               | 9                                    | NR                             | 900               | 0                                    | NR                             |
| 385               | 1                                    | NR                             | 515               | 514                                  | NR                             | 645               | 400                                  | NR                             | 775               | 8                                    | NR                             | 905               | 0                                    | NR                             |
| 390               | 3                                    | NR                             | 520               | 549                                  | NR                             | 650               | 350                                  | NR                             | 780               | 7                                    | NR                             | 910               | 0                                    | NR                             |
| 395               | 6                                    | NR                             | 525               | 581                                  | NR                             | 655               | 306                                  | NR                             | 785               | 6                                    | NR                             | 915               | 0                                    | NR                             |
| 400               | 11                                   | NR                             | 530               | 613                                  | NR                             | 660               | 265                                  | NR                             | 790               | 5                                    | NR                             | 920               | 0                                    | NR                             |
| 405               | 20                                   | NR                             | 535               | 647                                  | NR                             | 665               | 230                                  | NR                             | 795               | 4                                    | NR                             | 925               | 0                                    | NR                             |
| 410               | 37                                   | NR                             | 540               | 685                                  | NR                             | 670               | 198                                  | NR                             | 800               | 4                                    | NR                             | 930               | 0                                    | NR                             |
| 415               | 65                                   | NR                             | 545               | 727                                  | NR                             | 675               | 170                                  | NR                             | 805               | 3                                    | NR                             | 935               | 0                                    | NR                             |
| 420               | 111                                  | NR                             | 550               | 770                                  | NR                             | 680               | 147                                  | NR                             | 810               | 3                                    | NR                             | 940               | 0                                    | NR                             |
| 425               | 180                                  | NR                             | 555               | 815                                  | NR                             | 685               | 126                                  | NR                             | 815               | 3                                    | NR                             | 945               | 0                                    | NR                             |
| 430               | 275                                  | NR                             | 560               | 864                                  | NR                             | 690               | 107                                  | NR                             | 820               | 2                                    | NR                             | 950               | 0                                    | NR                             |
| 435               | 403                                  | NR                             | 565               | 907                                  | NR                             | 695               | 92                                   | NR                             | 825               | 2                                    | NR                             | 955               | 0                                    | NR                             |
| 440               | 562                                  | NR                             | 570               | 948                                  | NR                             | 700               | 78                                   | NR                             | 830               | 2                                    | NR                             | 960               | 0                                    | NR                             |
| 445               | 775                                  | NR                             | 575               | 977                                  | NR                             | 705               | 67                                   | NR                             | 835               | 2                                    | NR                             | 965               | 0                                    | NR                             |
| 450               | 933                                  | NR                             | 580               | 997                                  | NR                             | 710               | 57                                   | NR                             | 840               | 1                                    | NR                             | 970               | 0                                    | NR                             |
| 455               | 801                                  | NR                             | 585               | 999                                  | NR                             | 715               | 49                                   | NR                             | 845               | 1                                    | NR                             | 975               | 0                                    | NR                             |
| 460               | 562                                  | NR                             | 590               | 988                                  | NR                             | 720               | 42                                   | NR                             | 850               | 1                                    | NR                             | 980               | 0                                    | NR                             |
| 465               | 433                                  | NR                             | 595               | 963                                  | NR                             | 725               | 36                                   | NR                             | 855               | 1                                    | NR                             | 985               | 0                                    | NR                             |
| 470               | 332                                  | NR                             | 600               | 925                                  | NR                             | 730               | 31                                   | NR                             | 860               | 1                                    | NR                             | 990               | 0                                    | NR                             |
| 475               | 261                                  | NR                             | 605               | 877                                  | NR                             | 735               | 26                                   | NR                             | 865               | 1                                    | NR                             | 995               | 0                                    | NR                             |
| 480               | 243                                  | NR                             | 610               | 822                                  | NR                             | 740               | 22                                   | NR                             | 870               | 1                                    | NR                             | 1000              | 0                                    | NR                             |
| 485               | 253                                  | NR                             | 615               | 762                                  | NR                             | 745               | 19                                   | NR                             | 875               | 1                                    | NR                             |                   |                                      |                                |

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### Melanopic Flux vs. Wavelength



Melanopic Lumens: NR

M/P: 3.24

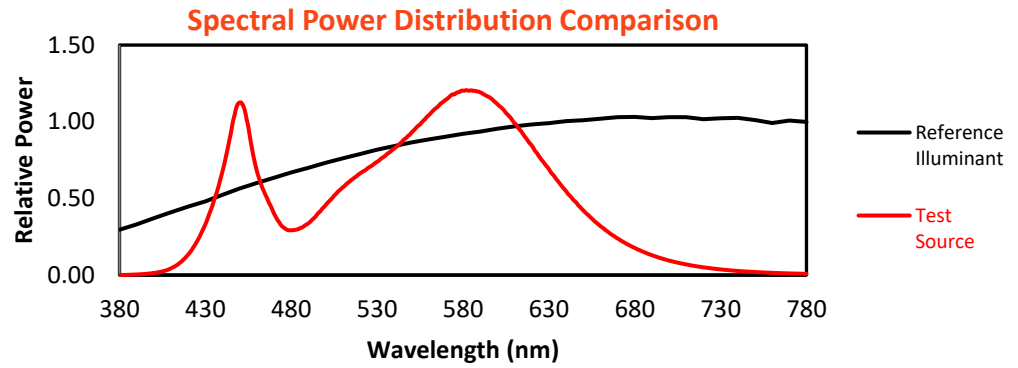
| λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) |
|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|
| 360       | 0                           | NR               | 490       | 280                         | NR               | 620       | 701                         | NR               | 750       | 16                          | NR               | 880       | 1                           | NR               |
| 365       | 0                           | NR               | 495       | 327                         | NR               | 625       | 633                         | NR               | 755       | 14                          | NR               | 885       | 0                           | NR               |
| 370       | 0                           | NR               | 500       | 378                         | NR               | 630       | 573                         | NR               | 760       | 12                          | NR               | 890       | 0                           | NR               |
| 375       | 0                           | NR               | 505       | 429                         | NR               | 635       | 511                         | NR               | 765       | 10                          | NR               | 895       | 0                           | NR               |
| 380       | 0                           | NR               | 510       | 474                         | NR               | 640       | 454                         | NR               | 770       | 9                           | NR               | 900       | 0                           | NR               |
| 385       | 1                           | NR               | 515       | 514                         | NR               | 645       | 400                         | NR               | 775       | 8                           | NR               | 905       | 0                           | NR               |
| 390       | 3                           | NR               | 520       | 549                         | NR               | 650       | 350                         | NR               | 780       | 7                           | NR               | 910       | 0                           | NR               |
| 395       | 6                           | NR               | 525       | 581                         | NR               | 655       | 306                         | NR               | 785       | 6                           | NR               | 915       | 0                           | NR               |
| 400       | 11                          | NR               | 530       | 613                         | NR               | 660       | 265                         | NR               | 790       | 5                           | NR               | 920       | 0                           | NR               |
| 405       | 20                          | NR               | 535       | 647                         | NR               | 665       | 230                         | NR               | 795       | 4                           | NR               | 925       | 0                           | NR               |
| 410       | 37                          | NR               | 540       | 685                         | NR               | 670       | 198                         | NR               | 800       | 4                           | NR               | 930       | 0                           | NR               |
| 415       | 65                          | NR               | 545       | 727                         | NR               | 675       | 170                         | NR               | 805       | 3                           | NR               | 935       | 0                           | NR               |
| 420       | 111                         | NR               | 550       | 770                         | NR               | 680       | 147                         | NR               | 810       | 3                           | NR               | 940       | 0                           | NR               |
| 425       | 180                         | NR               | 555       | 815                         | NR               | 685       | 126                         | NR               | 815       | 3                           | NR               | 945       | 0                           | NR               |
| 430       | 275                         | NR               | 560       | 864                         | NR               | 690       | 107                         | NR               | 820       | 2                           | NR               | 950       | 0                           | NR               |
| 435       | 403                         | NR               | 565       | 907                         | NR               | 695       | 92                          | NR               | 825       | 2                           | NR               | 955       | 0                           | NR               |
| 440       | 562                         | NR               | 570       | 948                         | NR               | 700       | 78                          | NR               | 830       | 2                           | NR               | 960       | 0                           | NR               |
| 445       | 775                         | NR               | 575       | 977                         | NR               | 705       | 67                          | NR               | 835       | 2                           | NR               | 965       | 0                           | NR               |
| 450       | 933                         | NR               | 580       | 997                         | NR               | 710       | 57                          | NR               | 840       | 1                           | NR               | 970       | 0                           | NR               |
| 455       | 801                         | NR               | 585       | 999                         | NR               | 715       | 49                          | NR               | 845       | 1                           | NR               | 975       | 0                           | NR               |
| 460       | 562                         | NR               | 590       | 988                         | NR               | 720       | 42                          | NR               | 850       | 1                           | NR               | 980       | 0                           | NR               |
| 465       | 433                         | NR               | 595       | 963                         | NR               | 725       | 36                          | NR               | 855       | 1                           | NR               | 985       | 0                           | NR               |
| 470       | 332                         | NR               | 600       | 925                         | NR               | 730       | 31                          | NR               | 860       | 1                           | NR               | 990       | 0                           | NR               |
| 475       | 261                         | NR               | 605       | 877                         | NR               | 735       | 26                          | NR               | 865       | 1                           | NR               | 995       | 0                           | NR               |
| 480       | 243                         | NR               | 610       | 822                         | NR               | 740       | 22                          | NR               | 870       | 1                           | NR               | 1000      | 0                           | NR               |
| 485       | 253                         | NR               | 615       | 762                         | NR               | 745       | 19                          | NR               | 875       | 1                           | NR               |           |                             |                  |

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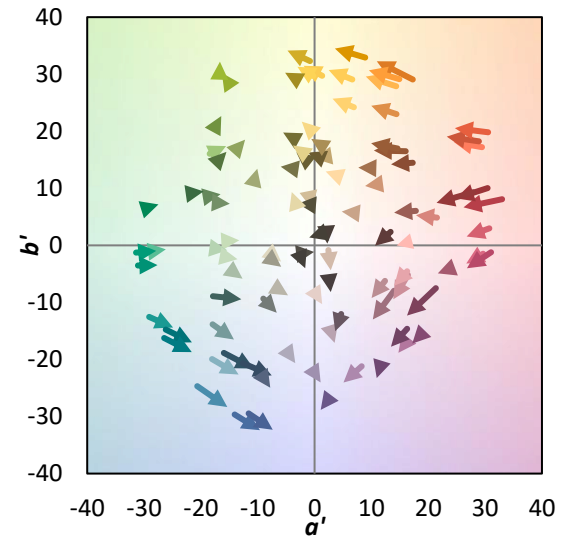
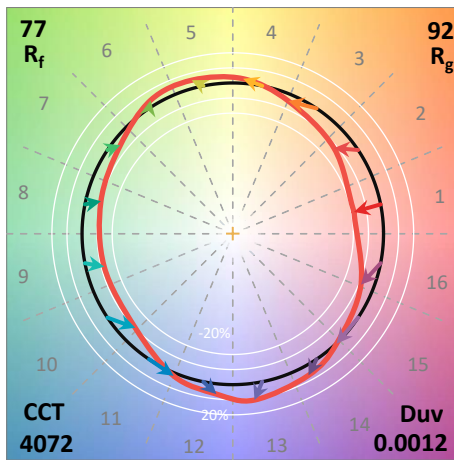
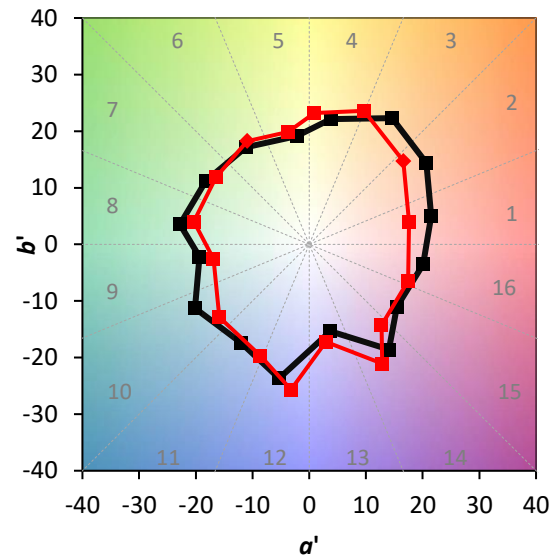
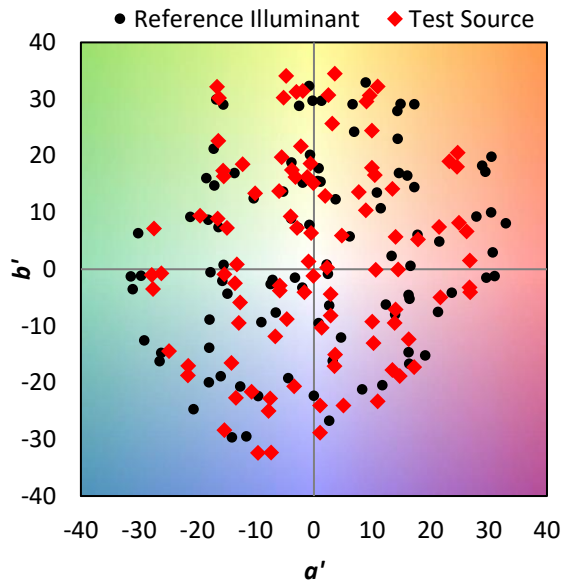
TM-30-18

### Summary

$R_f = 76.8$   
 $R_g = 91.7$   
 $CIE R_a = 73.2$   
 $R_g = -38.7$

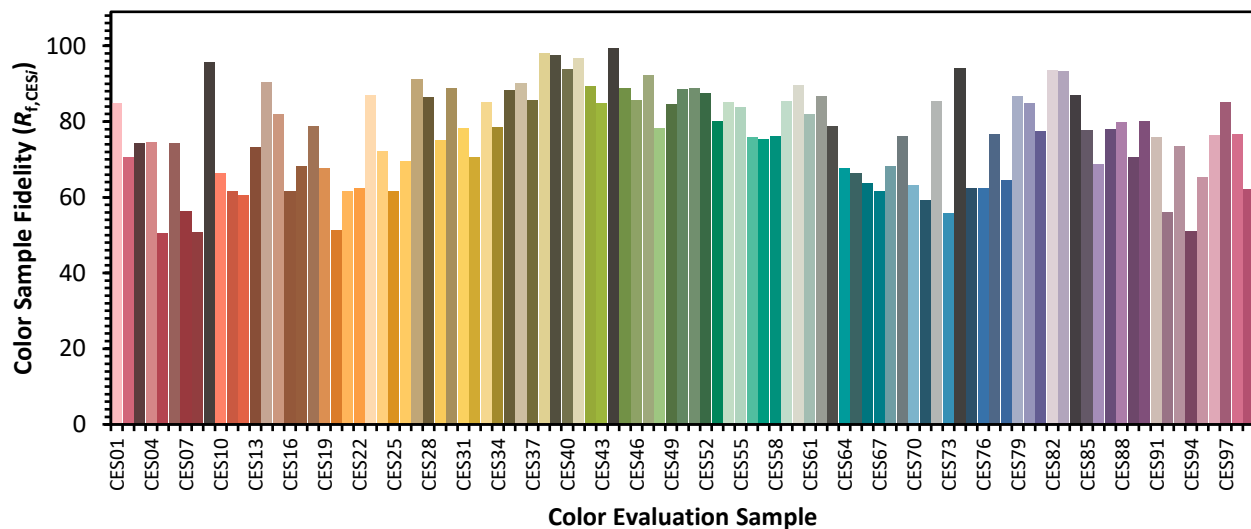


### Color Vector Graphics

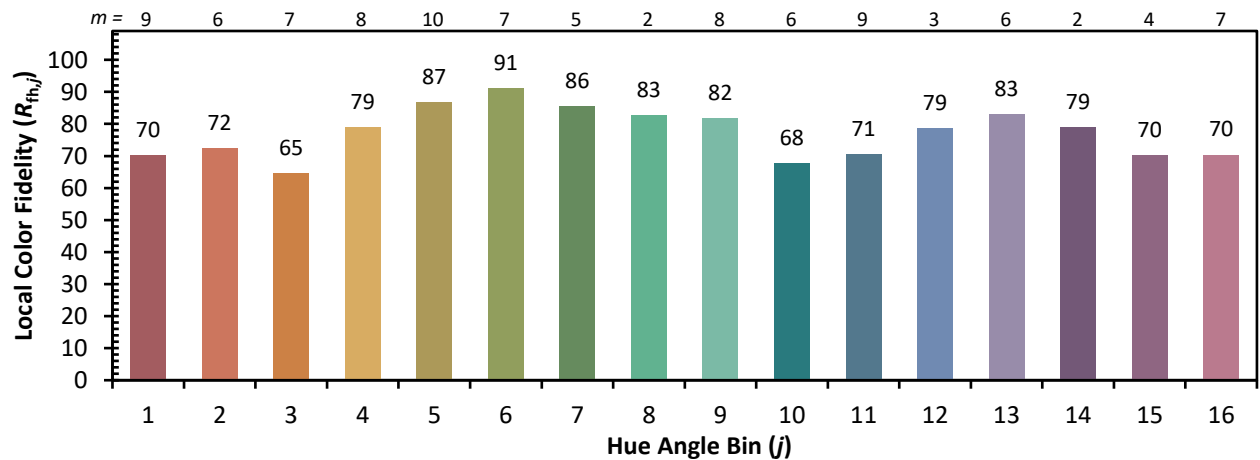
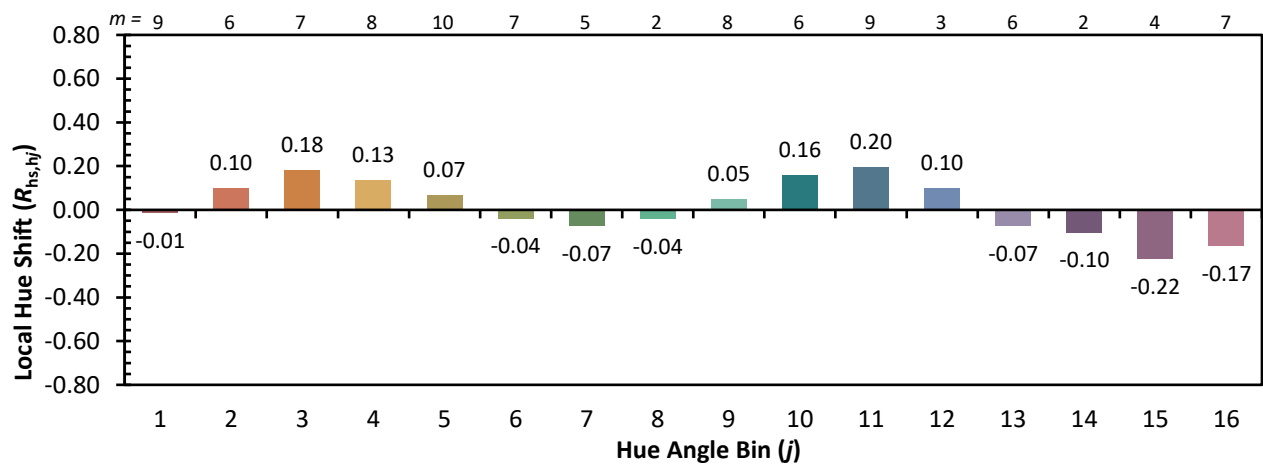
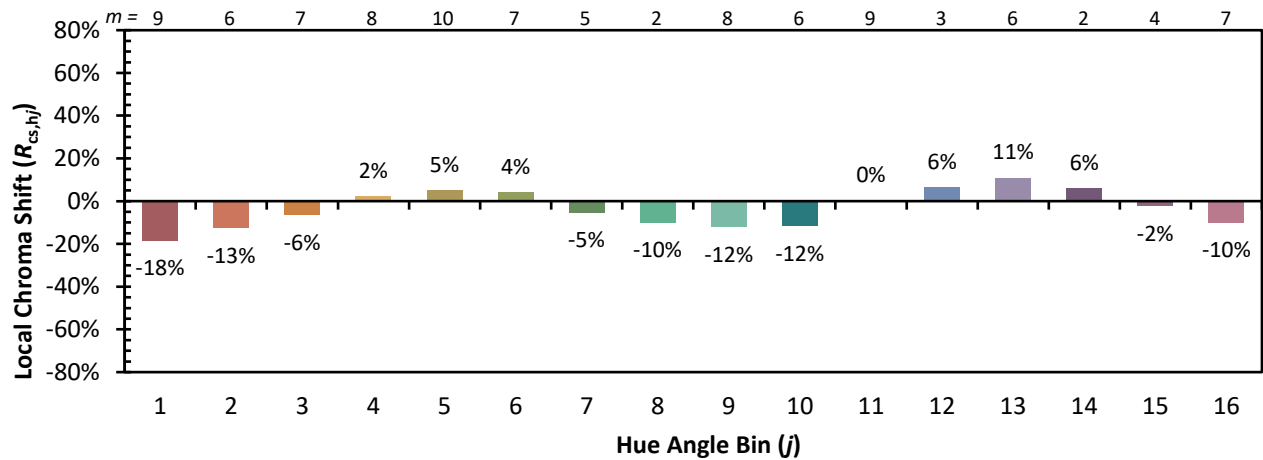


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

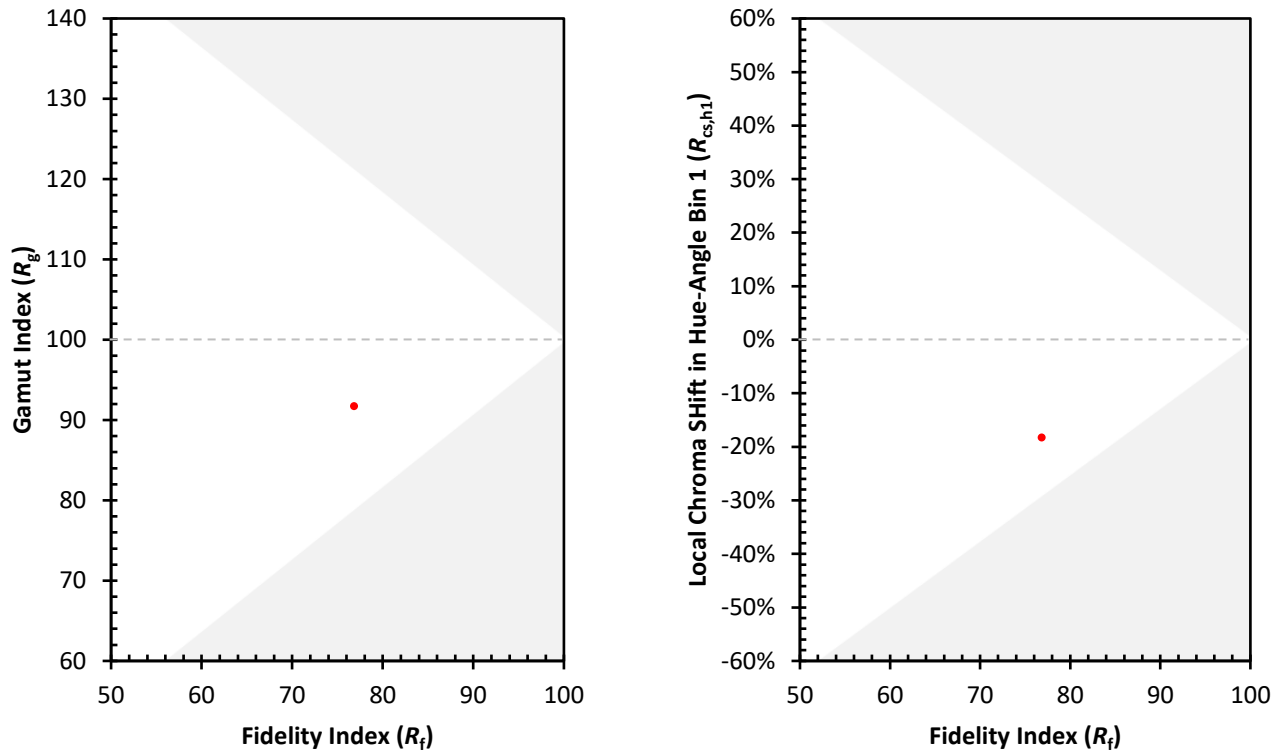
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 70 | CES51 = 89 | CES76 = 62 |
| CES02 = 61 | CES27 = 91 | CES52 = 87 | CES77 = 77 |
| CES03 = 30 | CES28 = 87 | CES53 = 80 | CES78 = 65 |
| CES04 = 70 | CES29 = 75 | CES54 = 85 | CES79 = 87 |
| CES05 = 47 | CES30 = 89 | CES55 = 84 | CES80 = 85 |
| CES06 = 50 | CES31 = 78 | CES56 = 76 | CES81 = 77 |
| CES07 = 39 | CES32 = 70 | CES57 = 75 | CES82 = 94 |
| CES08 = 38 | CES33 = 85 | CES58 = 76 | CES83 = 93 |
| CES09 = 29 | CES34 = 79 | CES59 = 85 | CES84 = 87 |
| CES10 = 74 | CES35 = 88 | CES60 = 90 | CES85 = 78 |
| CES11 = 57 | CES36 = 90 | CES61 = 82 | CES86 = 69 |
| CES12 = 63 | CES37 = 86 | CES62 = 87 | CES87 = 78 |
| CES13 = 42 | CES38 = 98 | CES63 = 79 | CES88 = 80 |
| CES14 = 74 | CES39 = 98 | CES64 = 68 | CES89 = 71 |
| CES15 = 71 | CES40 = 94 | CES65 = 66 | CES90 = 80 |
| CES16 = 46 | CES41 = 97 | CES66 = 64 | CES91 = 76 |
| CES17 = 49 | CES42 = 89 | CES67 = 62 | CES92 = 56 |
| CES18 = 56 | CES43 = 85 | CES68 = 68 | CES93 = 73 |
| CES19 = 72 | CES44 = 99 | CES69 = 76 | CES94 = 51 |
| CES20 = 64 | CES45 = 89 | CES70 = 63 | CES95 = 65 |
| CES21 = 86 | CES46 = 86 | CES71 = 59 | CES96 = 76 |
| CES22 = 78 | CES47 = 92 | CES72 = 85 | CES97 = 85 |
| CES23 = 92 | CES48 = 78 | CES73 = 56 | CES98 = 77 |
| CES24 = 91 | CES49 = 85 | CES74 = 94 | CES99 = 62 |
| CES25 = 72 | CES50 = 89 | CES75 = 62 |            |



Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)