

Signify Classified - Internal
Cooper Lighting Solutions Photometric Lab
1121 Highway 74 South
Peachtree City, GA 30269



Scaled data based on original data using
LM-79-08 Approved Method: Electrical and Photometric Measurements of Solid-
State Lighting Products

Test Report Prepared for
Cooper Lighting Solutions
(formerly Eaton)

Brand: McGRAW-EDISON

Report Number: P833248

Luminaire Tested: **TTN-D1-750-U-WQ-UPL1**

Issue Date: 5/15/2024

Test Information

Test Method: LM-79-08
Report Number: P833248
REPORT IS FROM IESNA LM-79-08 TEST DATA - UPLIGHT (G3-2308-121-4) AND
Test Lab: INNOVATION CENTER
Issue Date: 5/15/2024
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line: McGRAW-EDISON
Catalog Number: TTN-D1-750-U-WQ-UPL1
Description: TOPTIER NANO LED PARKING GARAGE LUMINAIRE WITH UPLIGHT
5000K, 70 CRI LEDS AND WIDE DISTRIBUTION
Light Source: -
Ballast/Driver: -

Summary

Lumens per Lamp: N/A
Luminaire Lumens: 3684.9 lumens
Efficiency: N/A
Efficacy: 127.1 lumens/watt
Luminous Opening: Vertical Cylinder (Dia: 0.71' x H: 0.1')
IES Classification: Type V - Short
BUG Rating: B2 - U3 - G1

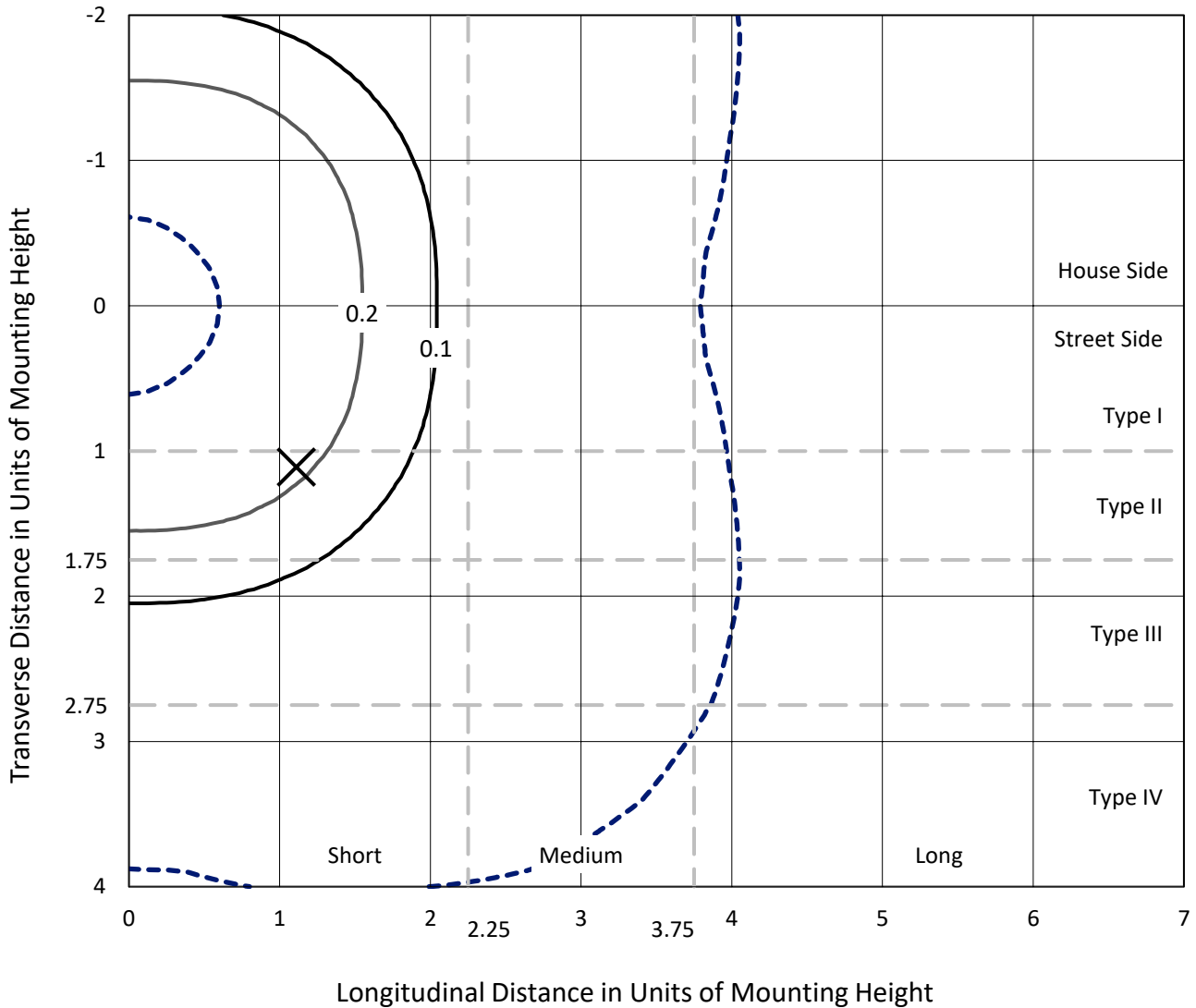
Input Watts (W): 29
Input Voltage (V): NR
Input Current (Ain): NR
Voltage Rise (V): NR
Power Factor: NR
Total Harmonic Distortion (THDi): NR
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 24 FT



REPORT NUMBER: P833248
 CATALOG NUMBER: TTN-D1-750-U-WQ-UPL1

Iso-Footcandle Lines of Horizontal Illumination

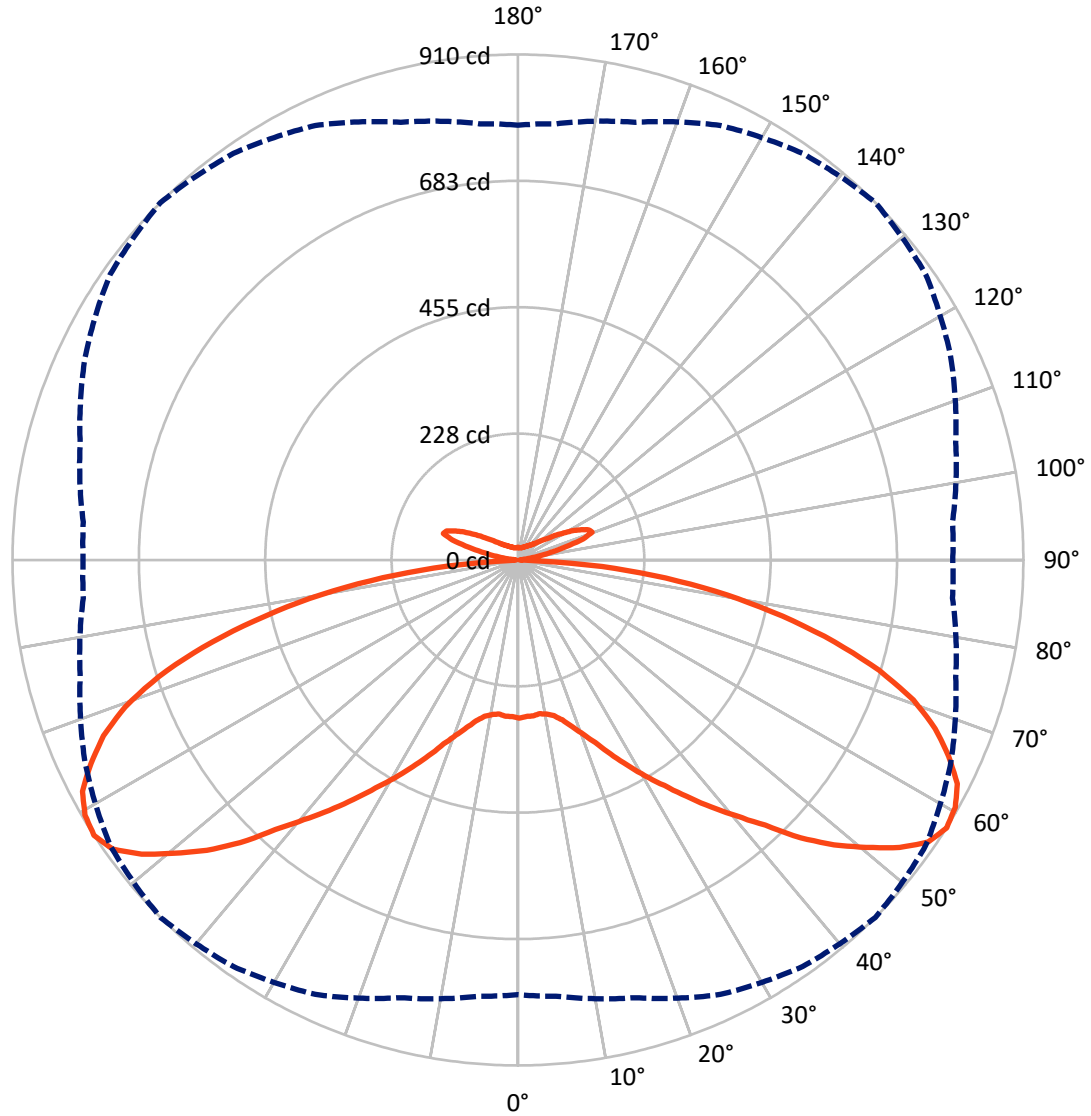
✕ Max cd
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 0.5 fc
 Type V - Short - N/A

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Luminous Intensity Polar Plot



— Vertical Plane Through 45-Deg Lateral - - - Horizontal Cone Through 57.5-Deg Vertical

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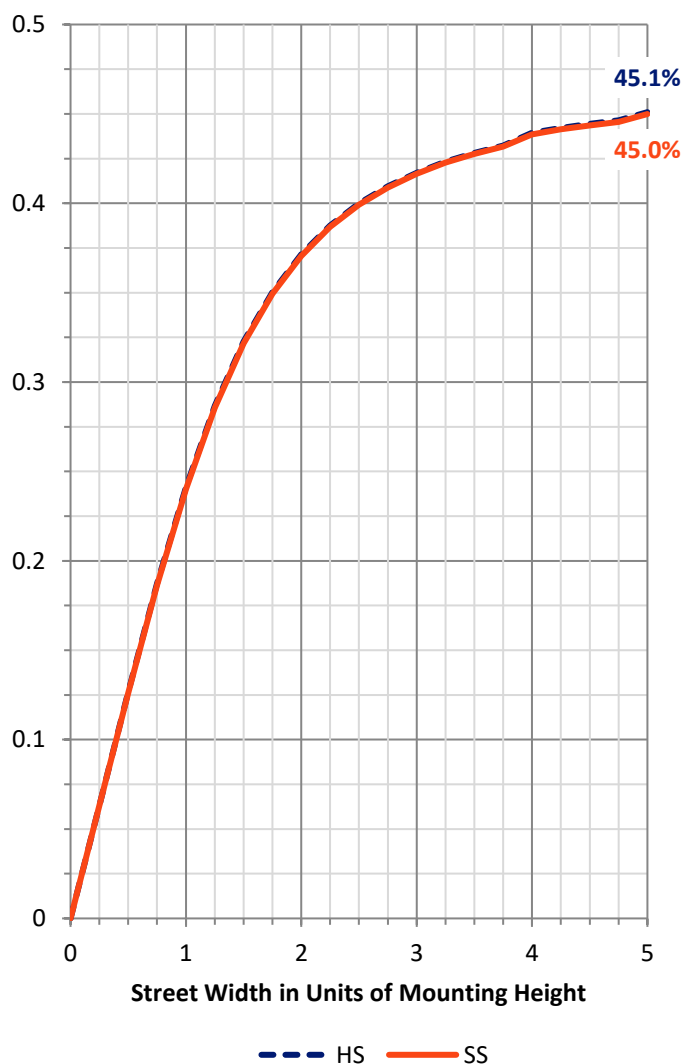
FLUX DISTRIBUTION:

| | | Downward | Upward | Total |
|--------------------|-----------|----------|--------|--------|
| House Side | Lumens | 1680.7 | 161.7 | 1842.4 |
| | % Fixture | 45.6 | 4.4 | 50.0 |
| Street Side | Lumens | 1680.7 | 161.7 | 1842.4 |
| | % Fixture | 45.6 | 4.4 | 50.0 |
| Total | Lumens | 3361.4 | 323.4 | 3684.9 |
| | % Fixture | 91.2 | 8.8 | 100.0 |

ZONAL LUMENS:

| Zone | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10° | 26.8 | 0.7 |
| 10°-20° | 85.5 | 2.3 |
| 20°-30° | 179.3 | 4.9 |
| 30°-40° | 325.3 | 8.8 |
| 40°-50° | 530.3 | 14.4 |
| 50°-60° | 742.2 | 20.1 |
| 60°-70° | 774.9 | 21.0 |
| 70°-80° | 553.6 | 15.0 |
| 80°-90° | 143.7 | 3.9 |
| 90°-100° | 7.2 | 0.2 |
| 100°-110° | 73.4 | 2.0 |
| 110°-120° | 107.3 | 2.9 |
| 120°-130° | 62.3 | 1.7 |
| 130°-140° | 33.0 | 0.9 |
| 140°-150° | 19.6 | 0.5 |
| 150°-160° | 12.1 | 0.3 |
| 160°-170° | 6.6 | 0.2 |
| 170°-180° | 2.1 | 0.1 |
| 0°-90° | 3361.4 | 91.2 |
| 0°-180° | 3684.9 | 100.0 |

Coefficient of Utilization



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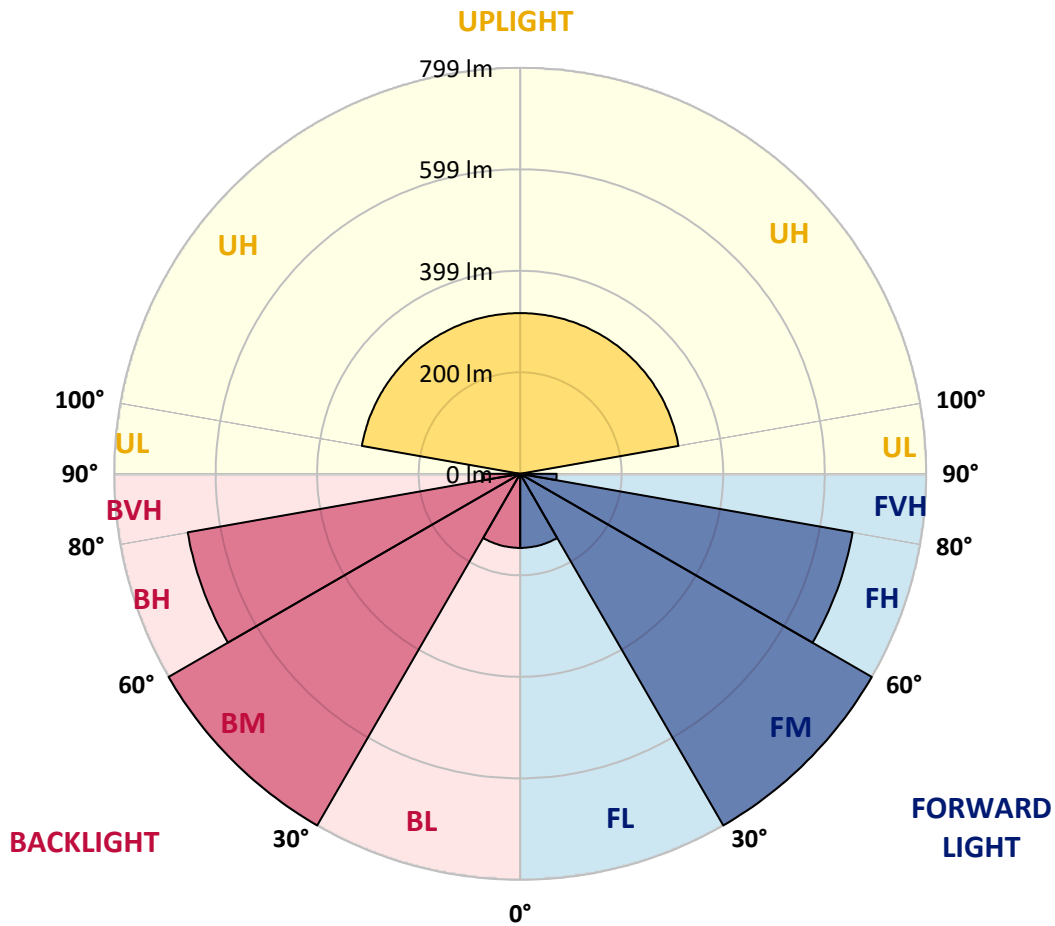
CATALOG NUMBER: TTN-D1-750-U-WQ-UPL1

LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | | Lumens | % Fixture | Zone Rating/Lumen Limit | | |
|------|-------------|--------|-----------|-------------------------|--------|---------|
| | | | | B | U | G |
| FL | (0°-30°) | 145.8 | 4.0 | | | |
| FM | (30°-60°) | 798.9 | 21.7 | | | |
| FH | (60°-80°) | 664.2 | 18.0 | | | G1/1800 |
| FVH | (80°-90°) | 71.8 | 1.9 | | | G1/100 |
| BL | (0°-30°) | 145.8 | 4.0 | B1/500 | | |
| BM | (30°-60°) | 798.9 | 21.7 | B1/1000 | | |
| BH | (60°-80°) | 664.2 | 18.0 | B2/1000 | | G1/1800 |
| BVH | (80°-90°) | 71.8 | 1.9 | | | G1/100 |
| UL | (90°-100°) | 7.2 | 0.2 | | U1/10 | |
| UH | (100°-180°) | 316.2 | 8.6 | | U3/500 | |

BUG Rating: B2-U3-G1

Type V Short





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 CATALOG NUMBER: TTN-D1-750-U-WQ-UPL1

CANDELA DISTRIBUTION (FULL):

| | 0° | 5° | 15° | 25° | 35° | 45° | 55° | 65° | 75° | 85° | 90° |
|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0° | 284.9 | 284.9 | 284.9 | 284.9 | 284.9 | 284.9 | 284.9 | 284.9 | 284.9 | 284.9 | 284.9 |
| 2.5° | 282.1 | 282.1 | 282.1 | 282.1 | 282.1 | 282.1 | 282.1 | 282.1 | 282.1 | 282.1 | 282.1 |
| 5° | 282.1 | 282.1 | 282.1 | 282.1 | 282.1 | 282.1 | 282.1 | 282.1 | 282.1 | 282.1 | 282.1 |
| 7.5° | 276.6 | 276.6 | 279.4 | 279.4 | 279.4 | 279.4 | 279.4 | 279.4 | 279.4 | 279.4 | 279.4 |
| 10° | 276.6 | 276.6 | 279.4 | 279.4 | 282.1 | 282.1 | 282.1 | 279.4 | 279.4 | 276.6 | 276.6 |
| 12.5° | 282.1 | 282.1 | 282.1 | 284.9 | 287.7 | 287.7 | 287.7 | 284.9 | 284.9 | 282.1 | 282.1 |
| 15° | 290.4 | 293.2 | 293.2 | 296.0 | 298.7 | 298.7 | 298.7 | 296.0 | 296.0 | 293.2 | 293.2 |
| 17.5° | 307.0 | 307.0 | 307.0 | 309.8 | 312.6 | 315.3 | 315.3 | 309.8 | 309.8 | 307.0 | 309.8 |
| 20° | 323.6 | 326.4 | 326.4 | 329.1 | 331.9 | 334.7 | 331.9 | 329.1 | 326.4 | 326.4 | 326.4 |
| 22.5° | 348.5 | 348.5 | 351.3 | 351.3 | 356.8 | 356.8 | 356.8 | 351.3 | 351.3 | 351.3 | 351.3 |
| 25° | 376.2 | 376.2 | 378.9 | 381.7 | 387.2 | 387.2 | 384.5 | 378.9 | 378.9 | 378.9 | 381.7 |
| 27.5° | 409.4 | 409.4 | 412.1 | 412.1 | 417.7 | 417.7 | 414.9 | 412.1 | 412.1 | 412.1 | 414.9 |
| 30° | 439.8 | 439.8 | 445.3 | 448.1 | 450.8 | 450.8 | 450.8 | 445.3 | 445.3 | 442.5 | 442.5 |
| 32.5° | 467.4 | 470.2 | 473.0 | 481.3 | 486.8 | 484.0 | 486.8 | 481.3 | 475.7 | 473.0 | 473.0 |
| 35° | 497.9 | 500.6 | 506.2 | 514.5 | 522.8 | 522.8 | 522.8 | 514.5 | 508.9 | 503.4 | 506.2 |
| 37.5° | 533.8 | 533.8 | 542.1 | 550.4 | 561.5 | 564.2 | 561.5 | 553.2 | 544.9 | 539.4 | 539.4 |
| 40° | 572.5 | 572.5 | 580.8 | 589.1 | 603.0 | 605.7 | 603.0 | 591.9 | 580.8 | 578.1 | 578.1 |
| 42.5° | 611.3 | 611.3 | 622.3 | 630.6 | 647.2 | 652.8 | 647.2 | 633.4 | 622.3 | 614.0 | 616.8 |
| 45° | 652.8 | 655.5 | 669.4 | 686.0 | 705.3 | 713.6 | 705.3 | 688.7 | 672.1 | 655.5 | 655.5 |
| 47.5° | 699.8 | 699.8 | 716.4 | 735.7 | 757.9 | 766.2 | 755.1 | 738.5 | 716.4 | 702.5 | 702.5 |
| 50° | 730.2 | 733.0 | 755.1 | 780.0 | 807.7 | 813.2 | 804.9 | 780.0 | 755.1 | 735.7 | 733.0 |
| 52.5° | 760.6 | 763.4 | 788.3 | 824.2 | 851.9 | 860.2 | 849.1 | 824.2 | 788.3 | 763.4 | 763.4 |
| 55° | 780.0 | 785.5 | 813.2 | 851.9 | 882.3 | 896.2 | 879.6 | 851.9 | 810.4 | 782.8 | 780.0 |
| 57.5° | 782.8 | 788.3 | 815.9 | 863.0 | 893.4 | 910.0 | 896.2 | 860.2 | 815.9 | 785.5 | 782.8 |
| 60° | 777.2 | 780.0 | 807.7 | 857.4 | 893.4 | 904.5 | 893.4 | 854.7 | 804.9 | 780.0 | 774.5 |
| 62.5° | 763.4 | 768.9 | 796.6 | 838.1 | 879.6 | 887.9 | 876.8 | 835.3 | 793.8 | 763.4 | 757.9 |
| 65° | 719.1 | 724.7 | 766.2 | 807.7 | 843.6 | 851.9 | 843.6 | 807.7 | 763.4 | 719.1 | 713.6 |
| 67.5° | 669.4 | 672.1 | 713.6 | 763.4 | 796.6 | 810.4 | 796.6 | 766.2 | 710.8 | 669.4 | 663.8 |
| 70° | 616.8 | 619.6 | 652.8 | 705.3 | 738.5 | 755.1 | 741.3 | 708.1 | 650.0 | 614.0 | 611.3 |
| 72.5° | 556.0 | 556.0 | 589.1 | 630.6 | 663.8 | 680.4 | 669.4 | 627.9 | 583.6 | 547.7 | 542.1 |
| 75° | 473.0 | 475.7 | 511.7 | 542.1 | 578.1 | 589.1 | 578.1 | 544.9 | 503.4 | 467.4 | 461.9 |
| 77.5° | 387.2 | 390.0 | 420.4 | 445.3 | 478.5 | 486.8 | 478.5 | 450.8 | 412.1 | 381.7 | 378.9 |
| 80° | 293.2 | 296.0 | 320.8 | 343.0 | 370.6 | 381.7 | 373.4 | 345.7 | 315.3 | 287.7 | 279.4 |
| 82.5° | 190.8 | 193.6 | 218.5 | 235.1 | 260.0 | 268.3 | 262.8 | 237.9 | 213.0 | 185.3 | 182.6 |
| 85° | 85.7 | 88.5 | 110.6 | 124.5 | 143.8 | 152.1 | 146.6 | 124.5 | 105.1 | 80.2 | 74.7 |
| 87.5° | 8.3 | 8.3 | 8.3 | 8.3 | 8.3 | 11.1 | 11.1 | 8.3 | 8.3 | 8.3 | 8.3 |
| 90° | 2.8 | 2.8 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | 2.8 | 2.8 |
| 92.5° | 2.8 | 2.8 | 2.8 | 3.9 | 4.4 | 3.9 | 4.4 | 3.3 | 3.3 | 2.8 | 2.8 |
| 95° | 3.3 | 3.3 | 3.9 | 5.0 | 6.1 | 6.6 | 6.6 | 3.9 | 3.9 | 3.3 | 3.3 |
| 97.5° | 4.4 | 5.0 | 5.0 | 6.1 | 10.0 | 18.3 | 11.1 | 5.5 | 5.5 | 5.0 | 4.4 |
| 100° | 7.2 | 7.7 | 7.7 | 13.8 | 29.3 | 39.3 | 28.2 | 14.4 | 10.5 | 7.7 | 7.7 |
| 102.5° | 23.2 | 24.3 | 29.9 | 44.8 | 66.4 | 60.3 | 50.9 | 48.1 | 33.2 | 26.6 | 25.5 |
| 105° | 59.2 | 58.7 | 63.1 | 74.7 | 93.0 | 91.3 | 84.1 | 76.4 | 65.8 | 60.9 | 60.9 |
| 107.5° | 78.0 | 78.0 | 81.9 | 91.9 | 105.7 | 123.4 | 125.1 | 99.0 | 86.9 | 81.3 | 80.8 |
| 110° | 88.0 | 88.0 | 91.3 | 99.6 | 117.9 | 142.8 | 141.6 | 122.3 | 107.3 | 100.2 | 99.0 |



REPORT NUMBER: P833248
 CATALOG NUMBER: TTN-D1-750-U-WQ-UPL1

CANDELA DISTRIBUTION (continued):

| | 0° | 5° | 15° | 25° | 35° | 45° | 55° | 65° | 75° | 85° | 90° |
|--------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|
| 112.5° | 90.2 | 90.7 | 95.2 | 107.9 | 127.8 | 138.9 | 133.9 | 126.2 | 119.5 | 114.0 | 112.9 |
| 115° | 93.5 | 93.5 | 98.5 | 110.7 | 121.7 | 126.2 | 120.6 | 114.5 | 110.1 | 107.9 | 109.0 |
| 117.5° | 92.4 | 94.1 | 95.2 | 101.8 | 109.0 | 112.3 | 109.6 | 101.3 | 97.9 | 96.8 | 95.2 |
| 120° | 85.8 | 85.8 | 86.9 | 90.2 | 94.1 | 95.7 | 94.6 | 89.1 | 86.3 | 85.8 | 84.7 |
| 122.5° | 76.4 | 76.9 | 76.4 | 78.0 | 80.8 | 82.4 | 81.3 | 76.9 | 75.8 | 75.8 | 74.7 |
| 125° | 67.0 | 67.0 | 66.4 | 67.5 | 69.2 | 68.6 | 69.2 | 67.0 | 66.4 | 66.4 | 65.8 |
| 127.5° | 60.3 | 59.8 | 58.7 | 59.2 | 59.8 | 59.8 | 60.3 | 58.1 | 58.7 | 59.2 | 58.7 |
| 130° | 53.7 | 53.7 | 52.6 | 52.6 | 52.6 | 51.5 | 52.6 | 51.5 | 52.0 | 52.6 | 53.1 |
| 132.5° | 47.6 | 47.6 | 45.9 | 45.4 | 45.4 | 45.4 | 45.9 | 45.4 | 46.5 | 47.6 | 47.6 |
| 135° | 42.6 | 42.6 | 40.9 | 41.5 | 41.5 | 40.9 | 41.5 | 40.9 | 42.1 | 42.6 | 42.6 |
| 137.5° | 38.7 | 38.7 | 37.6 | 37.6 | 37.6 | 37.1 | 37.6 | 37.6 | 38.2 | 39.3 | 39.8 |
| 140° | 35.4 | 35.4 | 34.9 | 34.9 | 34.3 | 34.9 | 34.9 | 34.9 | 35.4 | 36.0 | 36.0 |
| 142.5° | 33.8 | 33.2 | 32.6 | 32.1 | 32.6 | 32.6 | 32.6 | 32.1 | 32.6 | 33.8 | 33.8 |
| 145° | 31.0 | 31.0 | 30.4 | 30.4 | 30.4 | 31.0 | 30.4 | 30.4 | 31.0 | 31.0 | 31.5 |
| 147.5° | 29.3 | 29.3 | 28.8 | 29.3 | 29.3 | 29.3 | 29.3 | 28.8 | 29.3 | 29.3 | 29.9 |
| 150° | 28.8 | 28.2 | 27.7 | 28.2 | 28.2 | 27.7 | 27.7 | 27.7 | 27.7 | 28.2 | 28.2 |
| 152.5° | 27.1 | 27.1 | 26.6 | 27.1 | 26.6 | 26.6 | 26.6 | 26.6 | 26.6 | 27.1 | 27.7 |
| 155° | 26.0 | 26.0 | 25.5 | 26.0 | 26.0 | 26.0 | 26.0 | 26.0 | 26.0 | 26.0 | 26.0 |
| 157.5° | 24.9 | 25.5 | 24.9 | 24.9 | 24.9 | 24.9 | 24.9 | 24.9 | 24.9 | 25.5 | 25.5 |
| 160° | 24.3 | 24.3 | 24.3 | 24.3 | 23.8 | 23.8 | 23.8 | 24.3 | 24.3 | 24.3 | 24.9 |
| 162.5° | 23.8 | 23.8 | 23.8 | 23.8 | 23.2 | 23.2 | 23.2 | 23.2 | 23.8 | 23.8 | 24.3 |
| 165° | 23.8 | 23.2 | 23.2 | 23.2 | 22.7 | 22.7 | 22.7 | 22.7 | 23.2 | 23.8 | 23.2 |
| 167.5° | 22.7 | 22.7 | 22.7 | 22.7 | 22.7 | 22.1 | 22.1 | 22.7 | 22.7 | 22.7 | 23.2 |
| 170° | 22.7 | 22.7 | 22.1 | 22.1 | 22.1 | 22.1 | 22.1 | 22.1 | 22.1 | 22.1 | 22.7 |
| 172.5° | 22.7 | 22.7 | 22.7 | 22.7 | 22.1 | 22.1 | 22.1 | 22.1 | 22.1 | 22.7 | 22.7 |
| 175° | 22.7 | 22.7 | 22.7 | 22.7 | 22.1 | 22.1 | 22.1 | 22.7 | 22.7 | 22.7 | 22.1 |
| 177.5° | 22.7 | 22.7 | 22.7 | 22.7 | 22.1 | 22.7 | 22.7 | 22.7 | 22.7 | 22.7 | 22.7 |
| 180° | 22.7 | 22.7 | 22.7 | 22.7 | 22.7 | 22.7 | 22.7 | 22.7 | 22.7 | 22.7 | 22.7 |

Cooper Lighting Solutions Photometric Lab
1121 Highway 74 South
Peachtree City, GA 30269



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

Report Prepared for

Cooper Lighting Solutions

MCGRAW EDISON

Report Number: SP1-2411-284-3

Test Date: 11/21/2024

Luminaire Tested: TTN-D0-750-U-WQ

Data in this report applies to TT and TTN families of products

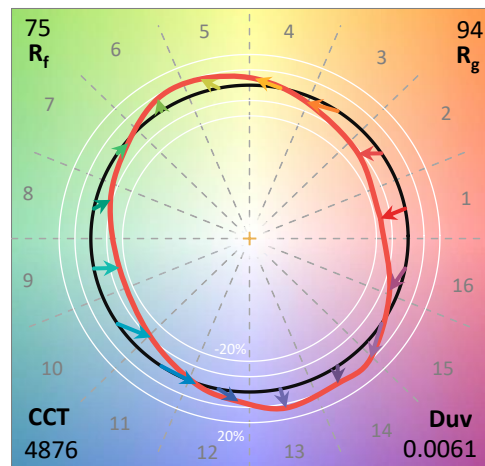
Test Information

Test Method: LM-79-2019
 Report Number: SP1-2411-284-3
 Test Lab: COOPER LIGHTING SOLUTIONS
 Photometer: SP1 - 76IN SPHERE
 Measurement Geometry: 4π
 Issue Date: 11/21/2024
 Manufacturer: COOPER LIGHTING SOLUTIONS
 Product Line: MCGRAW EDISON
 Catalog Number: **TTN-D0-750-U-WQ**
 Description: TOPTIER NANO LED PARKING GARAGE LUMINAIRE. 5000K, 70 CRI LEDS AND WIDE DISTRIBUTION

Spectral Parameters

CCT (K): 4876
 CIE u': 0.2086
 CIE v': 0.4932
 Duv: 0.0061
 CIE x: 0.3502
 CIE y: 0.3680
 CIE z: 0.2818
 Peak Wavelength (nm): 451
 Dominant Wavelength (nm): 569
 Purity: 15.51324
 Rf: 74.6
 Rg: 94.4

| | | | |
|-----------|------|------|-------|
| CRI (Ra): | 72.6 | | |
| R1: | 69.5 | R9: | -24.6 |
| R2: | 77.0 | R10: | 44.8 |
| R3: | 82.2 | R11: | 68.2 |
| R4: | 72.6 | R12: | 36.1 |
| R5: | 69.3 | R13: | 70.5 |
| R6: | 67.6 | R14: | 89.9 |
| R7: | 83.7 | R15: | 63.1 |
| R8: | 58.6 | | |



Test Conditions

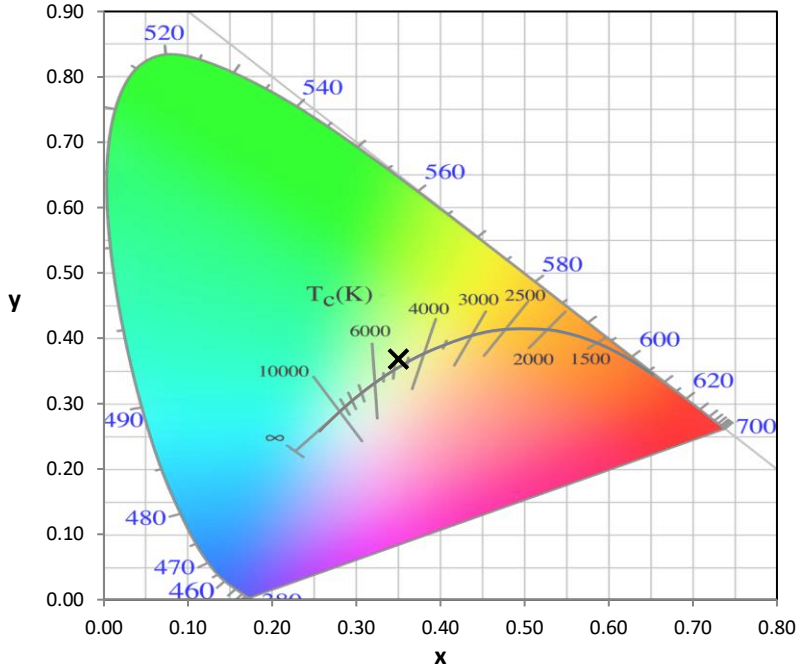
Stabilization Time: 51M
 Operation Time: 1H 51M
 Sphere Temperature (°C): 24.9

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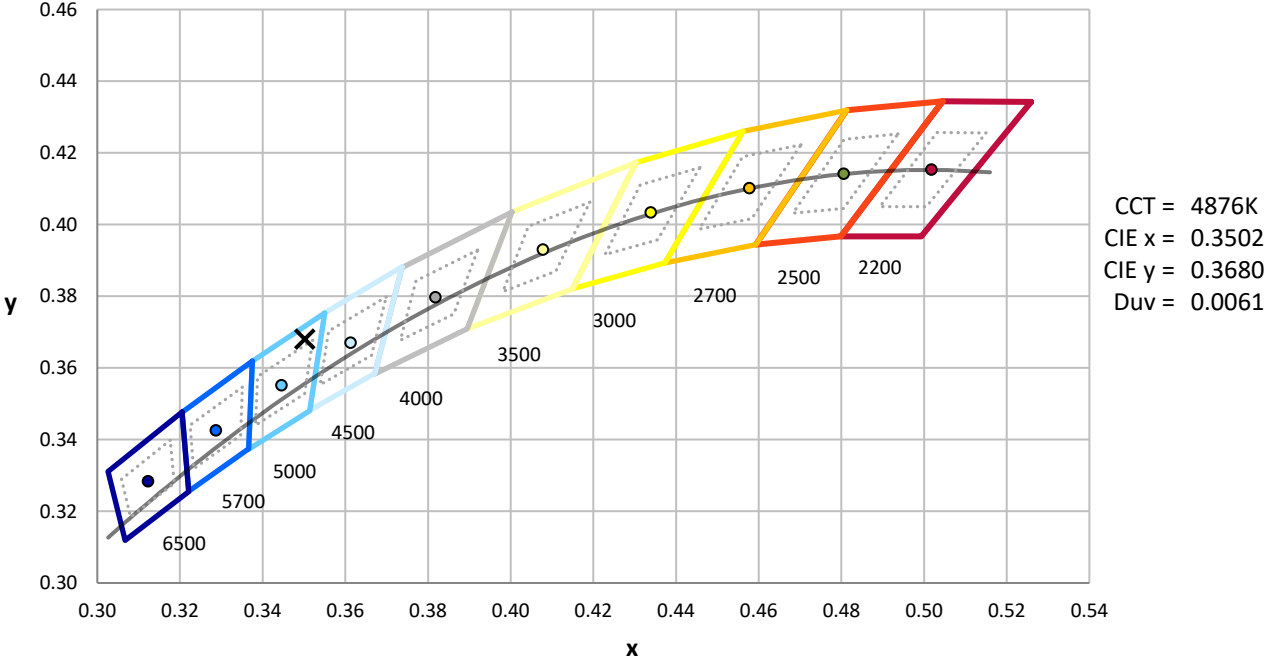
| Measurement and Test Equipment | | | |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument | Identification Number | Calibration Date | Calibration Due Date |
| Photometer | IN0058 | 6/18/2024 | 12/18/2024 |
| Power Meter | INXT2011004 | 2/8/2024 | 2/8/2025 |
| AC Power Source | IN0063 | 10/22/2024 | 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 |

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CIE 1931 Chromaticity Diagram



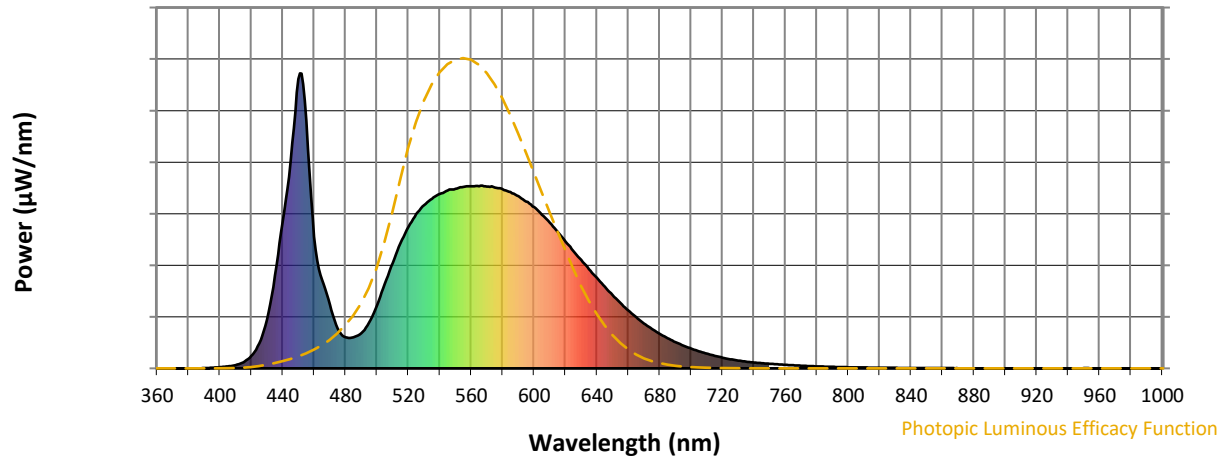
CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles



Point lies inside the ANSI 5000K 7-step quadrangle

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Photopic Flux vs. Wavelength

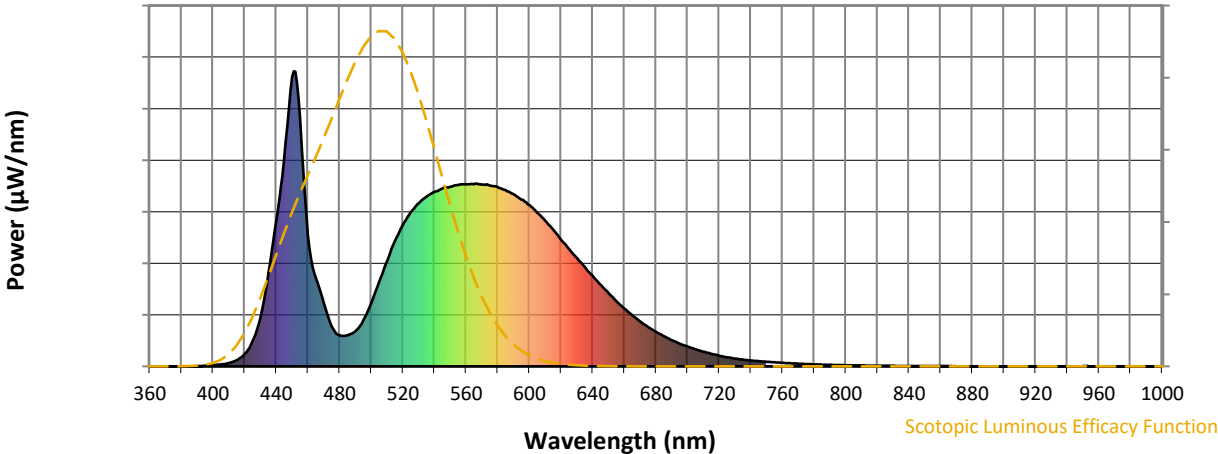


Photopic Lumens: NR

| λ (nm) | Power W [^] /nm | Lumens (ϕ /nm) | λ (nm) | Power W [^] /nm | Lumens (ϕ /nm) | λ (nm) | Power W [^] /nm | Lumens (ϕ /nm) | λ (nm) | Power W [^] /nm | Lumens (ϕ /nm) | λ (nm) | Power W [^] /nm | Lumens (ϕ /nm) |
|-------------------|-----------------------------|-------------------------|-------------------|-----------------------------|-------------------------|-------------------|-----------------------------|-------------------------|-------------------|-----------------------------|-------------------------|-------------------|-----------------------------|-------------------------|
| 360 | 0 | NR | 490 | 119 | NR | 620 | 430 | NR | 750 | 16 | NR | 880 | 0 | NR |
| 365 | 0 | NR | 495 | 156 | NR | 625 | 398 | NR | 755 | 14 | NR | 885 | 0 | NR |
| 370 | 0 | NR | 500 | 214 | NR | 630 | 368 | NR | 760 | 12 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 286 | NR | 635 | 336 | NR | 765 | 11 | NR | 895 | 0 | NR |
| 380 | 0 | NR | 510 | 357 | NR | 640 | 306 | NR | 770 | 9 | NR | 900 | 0 | NR |
| 385 | 0 | NR | 515 | 425 | NR | 645 | 276 | NR | 775 | 8 | NR | 905 | 0 | NR |
| 390 | 1 | NR | 520 | 480 | NR | 650 | 248 | NR | 780 | 7 | NR | 910 | 0 | NR |
| 395 | 2 | NR | 525 | 523 | NR | 655 | 221 | NR | 785 | 6 | NR | 915 | 0 | NR |
| 400 | 4 | NR | 530 | 554 | NR | 660 | 196 | NR | 790 | 5 | NR | 920 | 0 | NR |
| 405 | 7 | NR | 535 | 575 | NR | 665 | 173 | NR | 795 | 4 | NR | 925 | 0 | NR |
| 410 | 11 | NR | 540 | 592 | NR | 670 | 152 | NR | 800 | 4 | NR | 930 | 0 | NR |
| 415 | 21 | NR | 545 | 603 | NR | 675 | 133 | NR | 805 | 3 | NR | 935 | 0 | NR |
| 420 | 42 | NR | 550 | 609 | NR | 680 | 117 | NR | 810 | 3 | NR | 940 | 0 | NR |
| 425 | 85 | NR | 555 | 615 | NR | 685 | 102 | NR | 815 | 3 | NR | 945 | 0 | NR |
| 430 | 165 | NR | 560 | 617 | NR | 690 | 89 | NR | 820 | 2 | NR | 950 | 1 | NR |
| 435 | 316 | NR | 565 | 617 | NR | 695 | 77 | NR | 825 | 2 | NR | 955 | 0 | NR |
| 440 | 497 | NR | 570 | 616 | NR | 700 | 67 | NR | 830 | 2 | NR | 960 | 0 | NR |
| 445 | 702 | NR | 575 | 613 | NR | 705 | 58 | NR | 835 | 2 | NR | 965 | 0 | NR |
| 450 | 981 | NR | 580 | 607 | NR | 710 | 50 | NR | 840 | 1 | NR | 970 | 0 | NR |
| 455 | 840 | NR | 585 | 598 | NR | 715 | 43 | NR | 845 | 1 | NR | 975 | 0 | NR |
| 460 | 446 | NR | 590 | 583 | NR | 720 | 36 | NR | 850 | 1 | NR | 980 | 0 | NR |
| 465 | 300 | NR | 595 | 566 | NR | 725 | 31 | NR | 855 | 1 | NR | 985 | 0 | NR |
| 470 | 215 | NR | 600 | 546 | NR | 730 | 26 | NR | 860 | 1 | NR | 990 | 0 | NR |
| 475 | 135 | NR | 605 | 521 | NR | 735 | 23 | NR | 865 | 1 | NR | 995 | 0 | NR |
| 480 | 105 | NR | 610 | 494 | NR | 740 | 20 | NR | 870 | 1 | NR | 1000 | 0 | NR |
| 485 | 106 | NR | 615 | 463 | NR | 745 | 18 | NR | 875 | 0 | NR | | | |

REPORT NUMBER: SP1-2411-284-3

Scotopic Flux vs. Wavelength

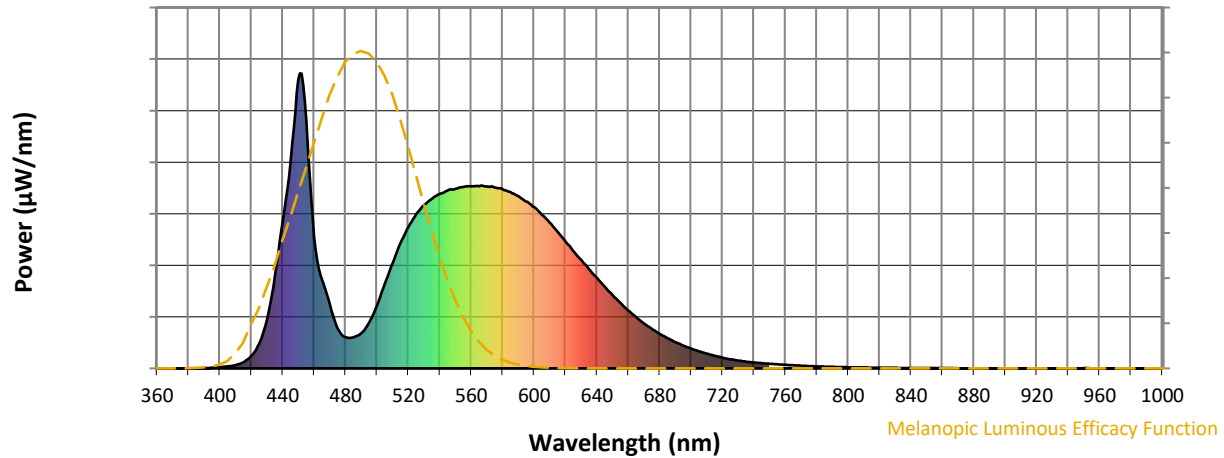


Scotopic Lumens: NR S/P: 1.74

| λ (nm) | Power W [^] /nm | Lumens (φ/nm) | λ (nm) | Power W [^] /nm | Lumens (φ/nm) | λ (nm) | Power W [^] /nm | Lumens (φ/nm) | λ (nm) | Power W [^] /nm | Lumens (φ/nm) | λ (nm) | Power W [^] /nm | Lumens (φ/nm) |
|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|
| 360 | 0 | NR | 490 | 119 | NR | 620 | 430 | NR | 750 | 16 | NR | 880 | 0 | NR |
| 365 | 0 | NR | 495 | 156 | NR | 625 | 398 | NR | 755 | 14 | NR | 885 | 0 | NR |
| 370 | 0 | NR | 500 | 214 | NR | 630 | 368 | NR | 760 | 12 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 286 | NR | 635 | 336 | NR | 765 | 11 | NR | 895 | 0 | NR |
| 380 | 0 | NR | 510 | 357 | NR | 640 | 306 | NR | 770 | 9 | NR | 900 | 0 | NR |
| 385 | 0 | NR | 515 | 425 | NR | 645 | 276 | NR | 775 | 8 | NR | 905 | 0 | NR |
| 390 | 1 | NR | 520 | 480 | NR | 650 | 248 | NR | 780 | 7 | NR | 910 | 0 | NR |
| 395 | 2 | NR | 525 | 523 | NR | 655 | 221 | NR | 785 | 6 | NR | 915 | 0 | NR |
| 400 | 4 | NR | 530 | 554 | NR | 660 | 196 | NR | 790 | 5 | NR | 920 | 0 | NR |
| 405 | 7 | NR | 535 | 575 | NR | 665 | 173 | NR | 795 | 4 | NR | 925 | 0 | NR |
| 410 | 11 | NR | 540 | 592 | NR | 670 | 152 | NR | 800 | 4 | NR | 930 | 0 | NR |
| 415 | 21 | NR | 545 | 603 | NR | 675 | 133 | NR | 805 | 3 | NR | 935 | 0 | NR |
| 420 | 42 | NR | 550 | 609 | NR | 680 | 117 | NR | 810 | 3 | NR | 940 | 0 | NR |
| 425 | 85 | NR | 555 | 615 | NR | 685 | 102 | NR | 815 | 3 | NR | 945 | 0 | NR |
| 430 | 165 | NR | 560 | 617 | NR | 690 | 89 | NR | 820 | 2 | NR | 950 | 1 | NR |
| 435 | 316 | NR | 565 | 617 | NR | 695 | 77 | NR | 825 | 2 | NR | 955 | 0 | NR |
| 440 | 497 | NR | 570 | 616 | NR | 700 | 67 | NR | 830 | 2 | NR | 960 | 0 | NR |
| 445 | 702 | NR | 575 | 613 | NR | 705 | 58 | NR | 835 | 2 | NR | 965 | 0 | NR |
| 450 | 981 | NR | 580 | 607 | NR | 710 | 50 | NR | 840 | 1 | NR | 970 | 0 | NR |
| 455 | 840 | NR | 585 | 598 | NR | 715 | 43 | NR | 845 | 1 | NR | 975 | 0 | NR |
| 460 | 446 | NR | 590 | 583 | NR | 720 | 36 | NR | 850 | 1 | NR | 980 | 0 | NR |
| 465 | 300 | NR | 595 | 566 | NR | 725 | 31 | NR | 855 | 1 | NR | 985 | 0 | NR |
| 470 | 215 | NR | 600 | 546 | NR | 730 | 26 | NR | 860 | 1 | NR | 990 | 0 | NR |
| 475 | 135 | NR | 605 | 521 | NR | 735 | 23 | NR | 865 | 1 | NR | 995 | 0 | NR |
| 480 | 105 | NR | 610 | 494 | NR | 740 | 20 | NR | 870 | 1 | NR | 1000 | 0 | NR |
| 485 | 106 | NR | 615 | 463 | NR | 745 | 18 | NR | 875 | 0 | NR | | | |

REPORT NUMBER: SP1-2411-284-3

Melanopic Flux vs. Wavelength



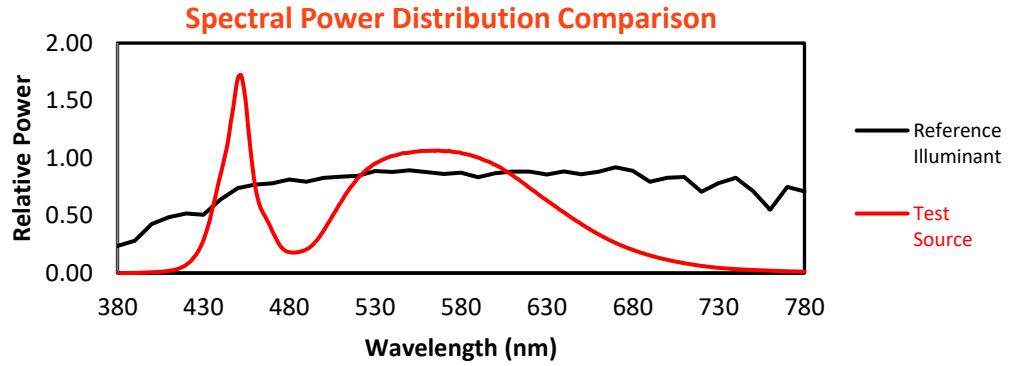
Melanopic Lumens: NR

M/P: 3.51

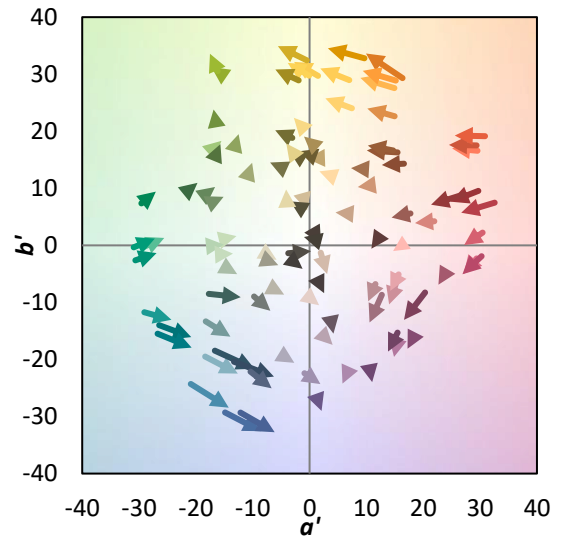
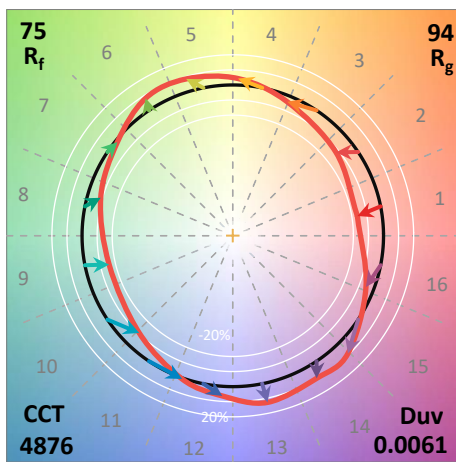
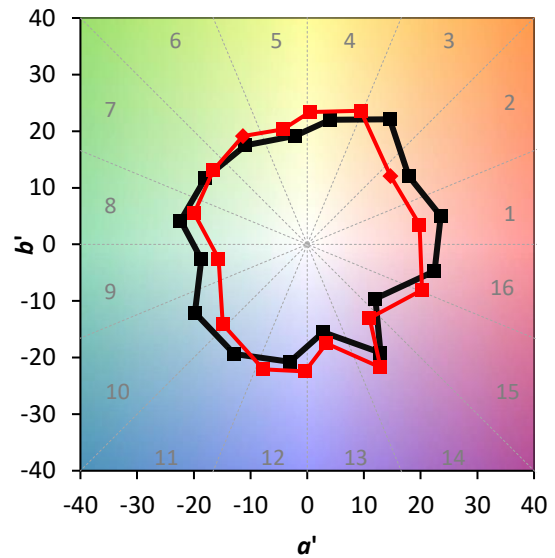
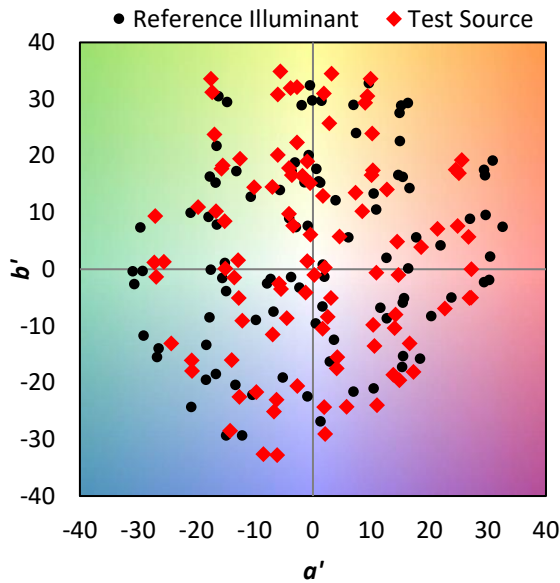
| λ (nm) | Power W [^] /nm | Lumens (φ/nm) | λ (nm) | Power W [^] /nm | Lumens (φ/nm) | λ (nm) | Power W [^] /nm | Lumens (φ/nm) | λ (nm) | Power W [^] /nm | Lumens (φ/nm) | λ (nm) | Power W [^] /nm | Lumens (φ/nm) |
|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|
| 360 | 0 | NR | 490 | 119 | NR | 620 | 430 | NR | 750 | 16 | NR | 880 | 0 | NR |
| 365 | 0 | NR | 495 | 156 | NR | 625 | 398 | NR | 755 | 14 | NR | 885 | 0 | NR |
| 370 | 0 | NR | 500 | 214 | NR | 630 | 368 | NR | 760 | 12 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 286 | NR | 635 | 336 | NR | 765 | 11 | NR | 895 | 0 | NR |
| 380 | 0 | NR | 510 | 357 | NR | 640 | 306 | NR | 770 | 9 | NR | 900 | 0 | NR |
| 385 | 0 | NR | 515 | 425 | NR | 645 | 276 | NR | 775 | 8 | NR | 905 | 0 | NR |
| 390 | 1 | NR | 520 | 480 | NR | 650 | 248 | NR | 780 | 7 | NR | 910 | 0 | NR |
| 395 | 2 | NR | 525 | 523 | NR | 655 | 221 | NR | 785 | 6 | NR | 915 | 0 | NR |
| 400 | 4 | NR | 530 | 554 | NR | 660 | 196 | NR | 790 | 5 | NR | 920 | 0 | NR |
| 405 | 7 | NR | 535 | 575 | NR | 665 | 173 | NR | 795 | 4 | NR | 925 | 0 | NR |
| 410 | 11 | NR | 540 | 592 | NR | 670 | 152 | NR | 800 | 4 | NR | 930 | 0 | NR |
| 415 | 21 | NR | 545 | 603 | NR | 675 | 133 | NR | 805 | 3 | NR | 935 | 0 | NR |
| 420 | 42 | NR | 550 | 609 | NR | 680 | 117 | NR | 810 | 3 | NR | 940 | 0 | NR |
| 425 | 85 | NR | 555 | 615 | NR | 685 | 102 | NR | 815 | 3 | NR | 945 | 0 | NR |
| 430 | 165 | NR | 560 | 617 | NR | 690 | 89 | NR | 820 | 2 | NR | 950 | 1 | NR |
| 435 | 316 | NR | 565 | 617 | NR | 695 | 77 | NR | 825 | 2 | NR | 955 | 0 | NR |
| 440 | 497 | NR | 570 | 616 | NR | 700 | 67 | NR | 830 | 2 | NR | 960 | 0 | NR |
| 445 | 702 | NR | 575 | 613 | NR | 705 | 58 | NR | 835 | 2 | NR | 965 | 0 | NR |
| 450 | 981 | NR | 580 | 607 | NR | 710 | 50 | NR | 840 | 1 | NR | 970 | 0 | NR |
| 455 | 840 | NR | 585 | 598 | NR | 715 | 43 | NR | 845 | 1 | NR | 975 | 0 | NR |
| 460 | 446 | NR | 590 | 583 | NR | 720 | 36 | NR | 850 | 1 | NR | 980 | 0 | NR |
| 465 | 300 | NR | 595 | 566 | NR | 725 | 31 | NR | 855 | 1 | NR | 985 | 0 | NR |
| 470 | 215 | NR | 600 | 546 | NR | 730 | 26 | NR | 860 | 1 | NR | 990 | 0 | NR |
| 475 | 135 | NR | 605 | 521 | NR | 735 | 23 | NR | 865 | 1 | NR | 995 | 0 | NR |
| 480 | 105 | NR | 610 | 494 | NR | 740 | 20 | NR | 870 | 1 | NR | 1000 | 0 | NR |
| 485 | 106 | NR | 615 | 463 | NR | 745 | 18 | NR | 875 | 0 | NR | | | |

Summary

$R_f = 74.6$
 $R_g = 94.4$
 $CIE R_a = 72.6$
 $R_g = -24.6$

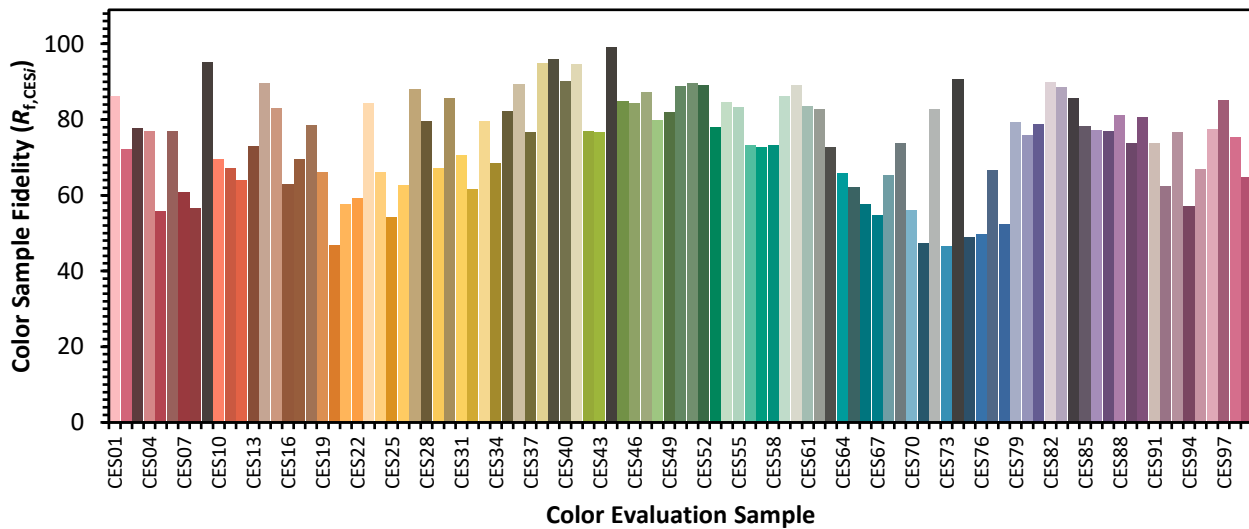


Color Vector Graphics

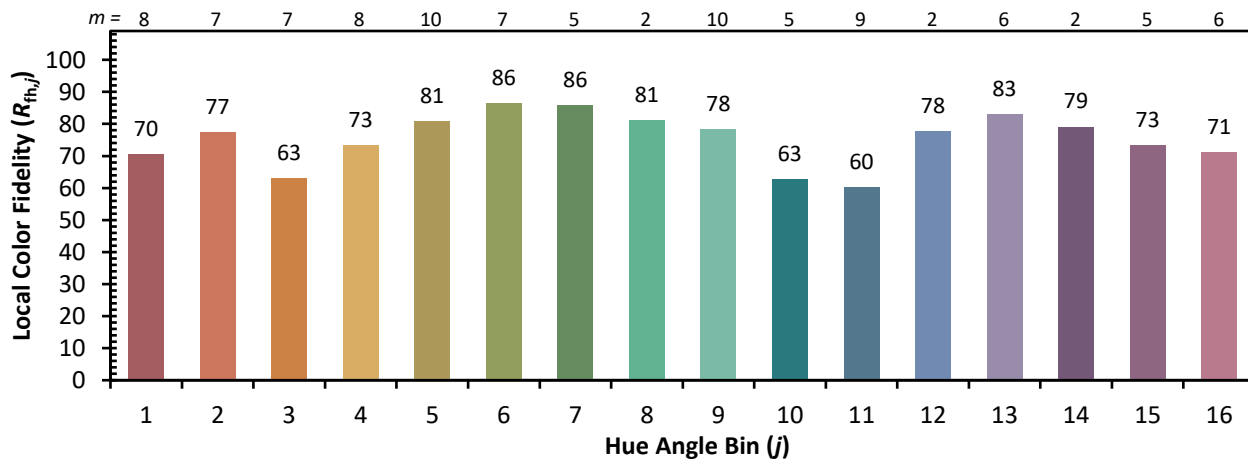
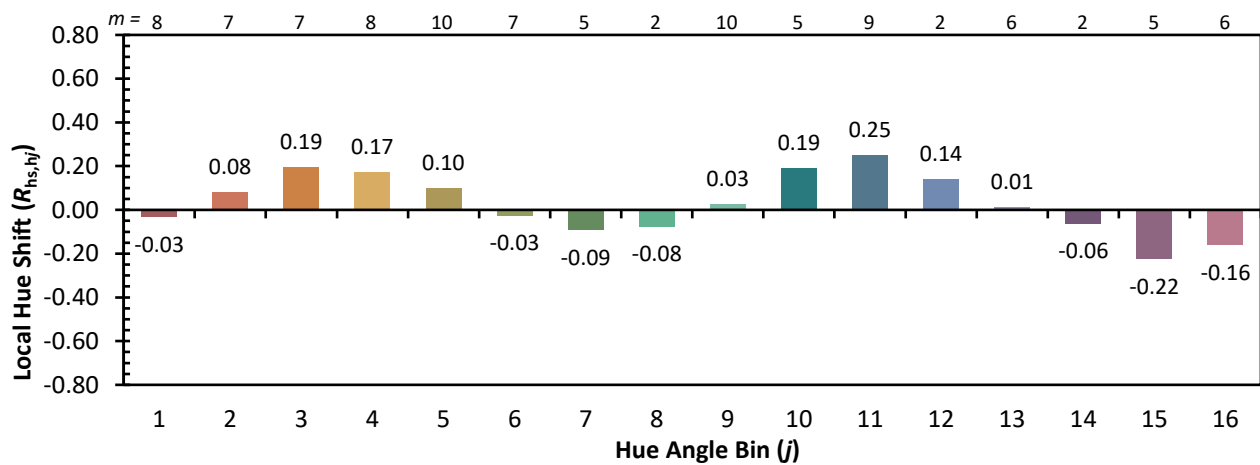
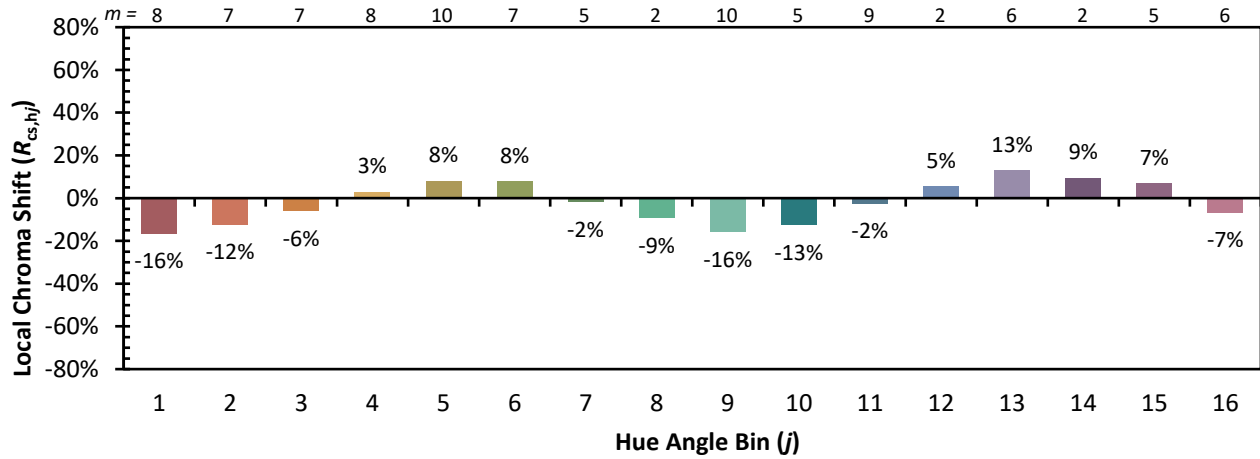


Individual Sample Fidelity Index ($R_{f,i}$)

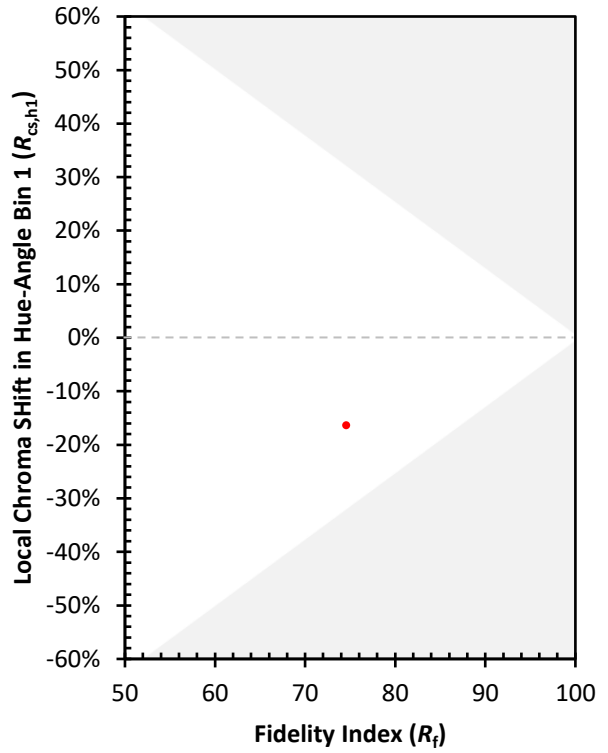
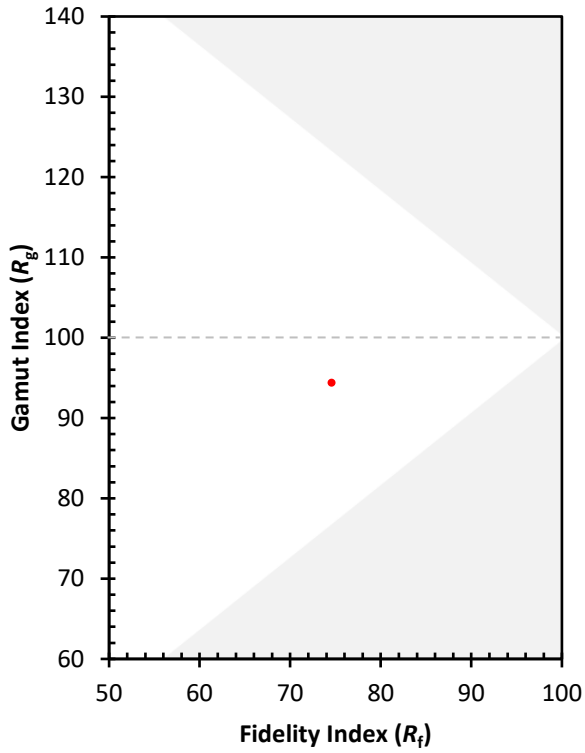
| | | | |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 63 | CES51 = 90 | CES76 = 50 |
| CES02 = 59 | CES27 = 88 | CES52 = 89 | CES77 = 67 |
| CES03 = 30 | CES28 = 80 | CES53 = 78 | CES78 = 52 |
| CES04 = 69 | CES29 = 67 | CES54 = 85 | CES79 = 79 |
| CES05 = 46 | CES30 = 86 | CES55 = 83 | CES80 = 76 |
| CES06 = 50 | CES31 = 70 | CES56 = 73 | CES81 = 79 |
| CES07 = 39 | CES32 = 62 | CES57 = 73 | CES82 = 90 |
| CES08 = 38 | CES33 = 80 | CES58 = 73 | CES83 = 89 |
| CES09 = 29 | CES34 = 69 | CES59 = 86 | CES84 = 86 |
| CES10 = 72 | CES35 = 82 | CES60 = 89 | CES85 = 78 |
| CES11 = 55 | CES36 = 89 | CES61 = 83 | CES86 = 77 |
| CES12 = 61 | CES37 = 77 | CES62 = 83 | CES87 = 77 |
| CES13 = 41 | CES38 = 95 | CES63 = 73 | CES88 = 81 |
| CES14 = 74 | CES39 = 96 | CES64 = 66 | CES89 = 74 |
| CES15 = 70 | CES40 = 90 | CES65 = 62 | CES90 = 81 |
| CES16 = 46 | CES41 = 95 | CES66 = 58 | CES91 = 74 |
| CES17 = 49 | CES42 = 77 | CES67 = 55 | CES92 = 62 |
| CES18 = 55 | CES43 = 77 | CES68 = 65 | CES93 = 77 |
| CES19 = 71 | CES44 = 99 | CES69 = 74 | CES94 = 57 |
| CES20 = 64 | CES45 = 85 | CES70 = 56 | CES95 = 67 |
| CES21 = 85 | CES46 = 84 | CES71 = 47 | CES96 = 77 |
| CES22 = 77 | CES47 = 87 | CES72 = 83 | CES97 = 85 |
| CES23 = 91 | CES48 = 80 | CES73 = 46 | CES98 = 75 |
| CES24 = 90 | CES49 = 82 | CES74 = 91 | CES99 = 65 |
| CES25 = 71 | CES50 = 89 | CES75 = 49 | |



Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)