

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: P832692

Luminaire Tested: **TTN-D3-750-U-MQ-CG**

Issue Date: 5/14/2024

**Test Information**

Test Method: LM-79-08  
Report Number: P832692  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2312-254-13)  
Test Lab: INNOVATION CENTER  
Issue Date: 5/14/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: MCGRAW-EDISON  
Catalog Number: TTN-D3-750-U-MQ-CG  
Description: TOPTIER NANO LED PARKING GARAGE LUMINAIRE  
5000K, 70 CRI LEDS AND MEDIUM DISTRIBUTION WITH CLEAR GLASS  
Light Source: -  
Ballast/Driver: -

**Summary**

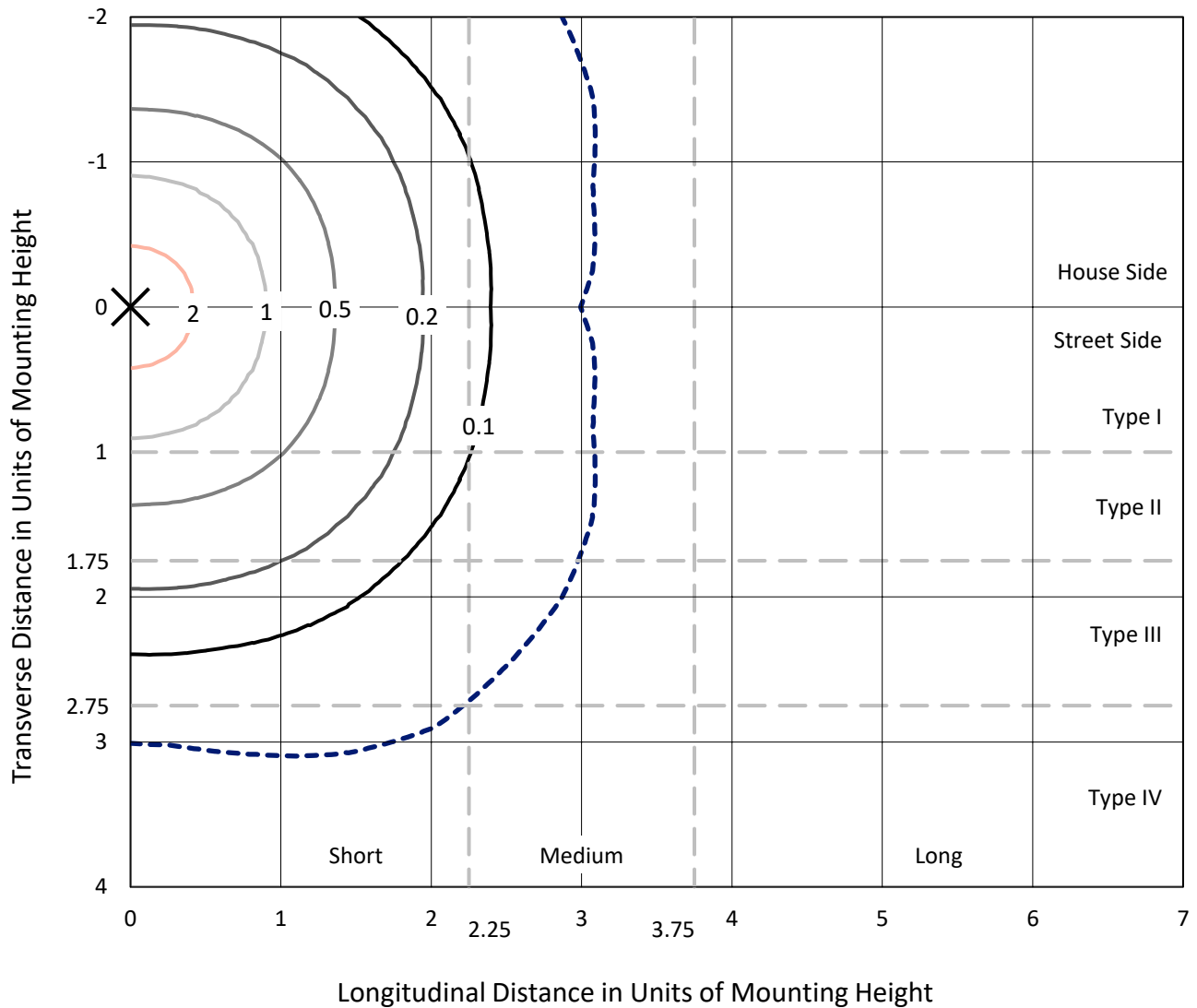
Lumens per Lamp: N/A  
Luminaire Lumens: 7133 lumens  
Efficiency: N/A  
Efficacy: 120.5 lumens/watt  
Luminous Opening: Circular (Dia: 0.71' x H: 0')  
IES Classification: Type V - Short  
BUG Rating: B3 - U0 - G1  
  
Input Watts (W): 59.2  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage 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: P832692  
 CATALOG NUMBER: TTN-D3-750-U-MQ-CG

### Iso-Footcandle Lines of Horizontal Illumination

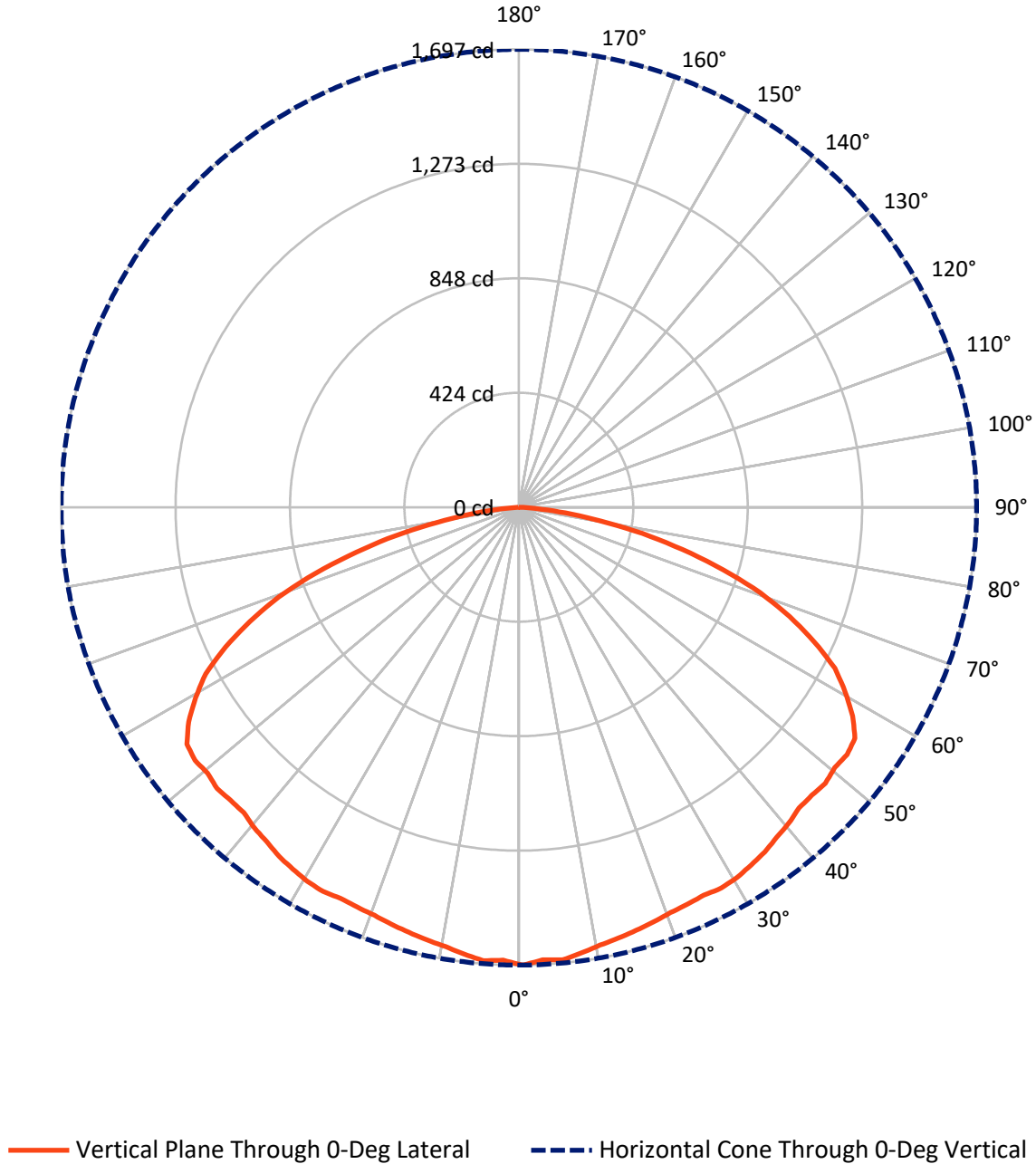
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 2.7 fc  
 Type V - Short - N/A

REPORT NUMBER: P832692  
CATALOG NUMBER: TTN-D3-750-U-MQ-CG

### Luminous Intensity Polar Plot



REPORT NUMBER: P832692

CATALOG NUMBER: TTN-D3-750-U-MQ-CG

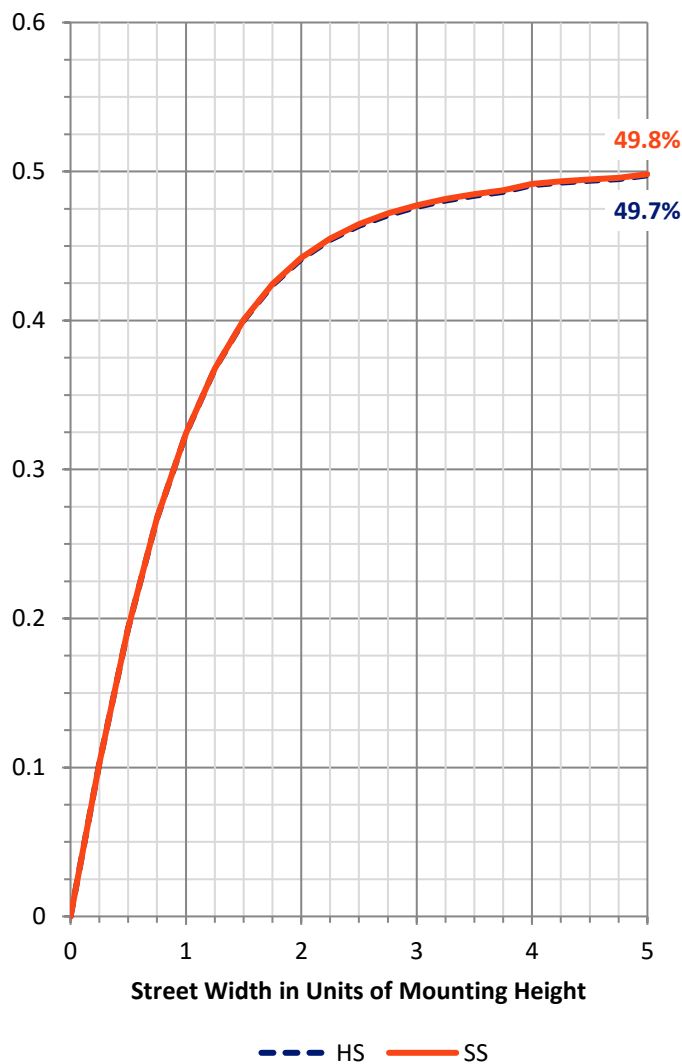
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 3566.5   | 0.0    | 3566.5 |
|                    | % Fixture | 50.0     | 0.0    | 50.0   |
| <b>Street Side</b> | Lumens    | 3566.5   | 0.0    | 3566.5 |
|                    | % Fixture | 50.0     | 0.0    | 50.0   |
| <b>Total</b>       | Lumens    | 7133.0   | 0.0    | 7133.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 159.4  | 2.2       |
| 10°-20°   | 461.0  | 6.5       |
| 20°-30°   | 741.6  | 10.4      |
| 30°-40°   | 990.7  | 13.9      |
| 40°-50°   | 1203.7 | 16.9      |
| 50°-60°   | 1398.6 | 19.6      |
| 60°-70°   | 1290.3 | 18.1      |
| 70°-80°   | 755.4  | 10.6      |
| 80°-90°   | 132.3  | 1.9       |
| 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°    | 7133.0 | 100.0     |
| 0°-180°   | 7133.0 | 100.0     |

**Coefficient of Utilization**



REPORT NUMBER: P832692

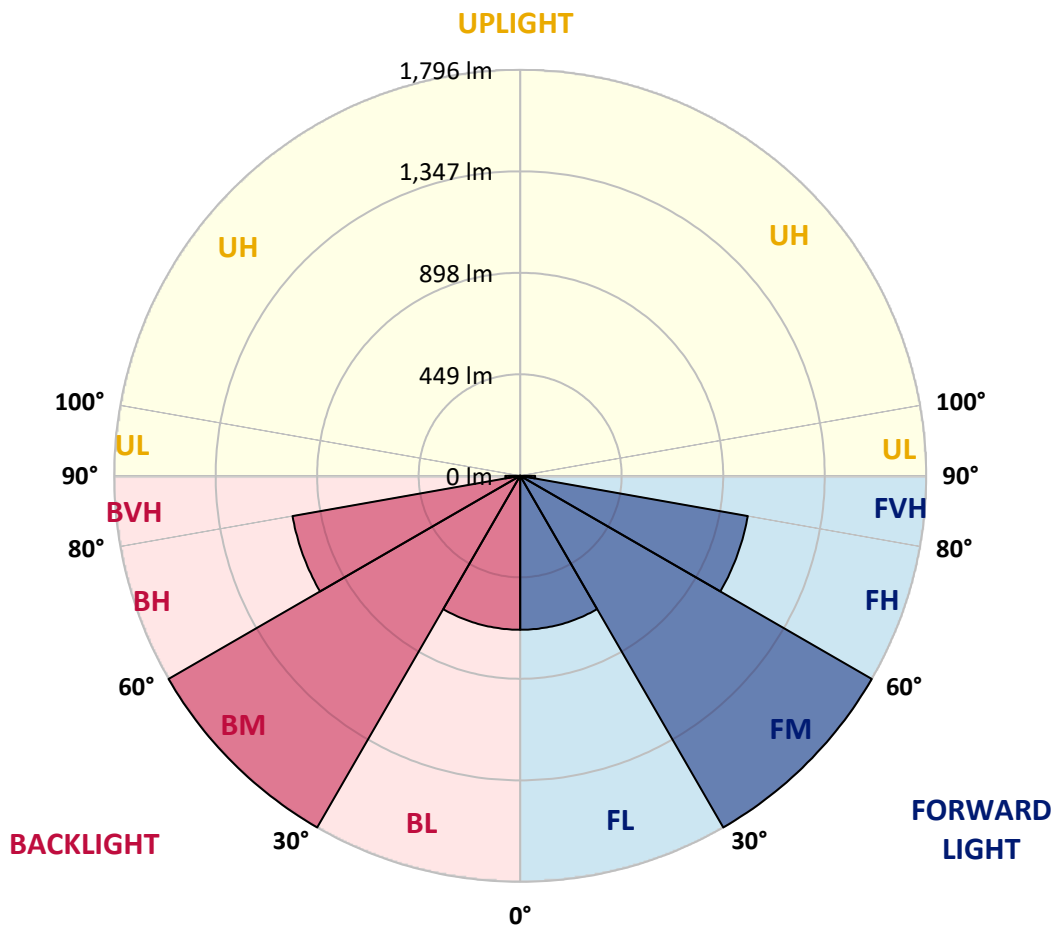
CATALOG NUMBER: TTN-D3-750-U-MQ-CG

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

| Zone           | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|----------------|--------|-----------|-------------------------|------|---------|
|                |        |           | B                       | U    | G       |
| FL (0°-30°)    | 681.0  | 9.5       |                         |      |         |
| FM (30°-60°)   | 1796.5 | 25.2      |                         |      |         |
| FH (60°-80°)   | 1022.8 | 14.3      |                         |      | G1/1800 |
| FVH (80°-90°)  | 66.2   | 0.9       |                         |      | G1/100  |
| BL (0°-30°)    | 681.0  | 9.5       | B2/1000                 |      |         |
| BM (30°-60°)   | 1796.5 | 25.2      | B2/2500                 |      |         |
| BH (60°-80°)   | 1022.8 | 14.3      | B3/2500                 |      | G1/1800 |
| BVH (80°-90°)  | 66.2   | 0.9       |                         |      | G1/100  |
| UL (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B3-U0-G1**

Type V Short





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 CATALOG NUMBER: TTN-D3-750-U-MQ-CG

**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 65°    | 75°    | 85°    | 90°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1696.9 | 1696.9 | 1696.9 | 1696.9 | 1696.9 | 1696.9 | 1696.9 | 1696.9 | 1696.9 | 1696.9 | 1696.9 |
| 2.5°  | 1679.6 | 1685.3 | 1679.6 | 1679.6 | 1679.6 | 1679.6 | 1679.6 | 1679.6 | 1679.6 | 1679.6 | 1685.3 |
| 5°    | 1685.3 | 1685.3 | 1685.3 | 1685.3 | 1679.6 | 1679.6 | 1679.6 | 1679.6 | 1679.6 | 1685.3 | 1685.3 |
| 7.5°  | 1668.0 | 1668.0 | 1668.0 | 1668.0 | 1668.0 | 1662.2 | 1668.0 | 1668.0 | 1668.0 | 1668.0 | 1668.0 |
| 10°   | 1650.6 | 1650.6 | 1650.6 | 1650.6 | 1650.6 | 1650.6 | 1650.6 | 1650.6 | 1650.6 | 1650.6 | 1650.6 |
| 12.5° | 1639.0 | 1639.0 | 1639.0 | 1639.0 | 1639.0 | 1639.0 | 1639.0 | 1639.0 | 1639.0 | 1633.2 | 1633.2 |
| 15°   | 1627.4 | 1627.4 | 1627.4 | 1627.4 | 1633.2 | 1633.2 | 1627.4 | 1627.4 | 1627.4 | 1627.4 | 1627.4 |
| 17.5° | 1615.8 | 1615.8 | 1615.8 | 1615.8 | 1621.6 | 1621.6 | 1621.6 | 1615.8 | 1615.8 | 1615.8 | 1615.8 |
| 20°   | 1604.3 | 1604.3 | 1604.3 | 1604.3 | 1610.1 | 1610.1 | 1610.1 | 1610.1 | 1610.1 | 1604.3 | 1604.3 |
| 22.5° | 1598.5 | 1598.5 | 1598.5 | 1598.5 | 1604.3 | 1604.3 | 1604.3 | 1604.3 | 1598.5 | 1598.5 | 1598.5 |
| 25°   | 1592.7 | 1598.5 | 1598.5 | 1598.5 | 1604.3 | 1610.1 | 1610.1 | 1604.3 | 1598.5 | 1592.7 | 1592.7 |
| 27.5° | 1598.5 | 1598.5 | 1598.5 | 1604.3 | 1604.3 | 1610.1 | 1610.1 | 1604.3 | 1598.5 | 1598.5 | 1598.5 |
| 30°   | 1592.7 | 1592.7 | 1592.7 | 1598.5 | 1604.3 | 1610.1 | 1604.3 | 1604.3 | 1598.5 | 1592.7 | 1592.7 |
| 32.5° | 1581.1 | 1581.1 | 1586.9 | 1592.7 | 1598.5 | 1598.5 | 1598.5 | 1592.7 | 1586.9 | 1581.1 | 1581.1 |
| 35°   | 1569.5 | 1569.5 | 1569.5 | 1575.3 | 1586.9 | 1586.9 | 1586.9 | 1581.1 | 1575.3 | 1569.5 | 1563.7 |
| 37.5° | 1552.1 | 1557.9 | 1557.9 | 1569.5 | 1575.3 | 1581.1 | 1575.3 | 1569.5 | 1557.9 | 1552.1 | 1552.1 |
| 40°   | 1540.6 | 1540.6 | 1546.3 | 1557.9 | 1569.5 | 1569.5 | 1563.7 | 1557.9 | 1546.3 | 1540.6 | 1540.6 |
| 42.5° | 1523.2 | 1523.2 | 1534.8 | 1546.3 | 1563.7 | 1563.7 | 1557.9 | 1546.3 | 1534.8 | 1523.2 | 1523.2 |
| 45°   | 1523.2 | 1523.2 | 1534.8 | 1557.9 | 1569.5 | 1581.1 | 1569.5 | 1557.9 | 1534.8 | 1523.2 | 1517.4 |
| 47.5° | 1529.0 | 1529.0 | 1540.6 | 1569.5 | 1592.7 | 1604.3 | 1586.9 | 1563.7 | 1540.6 | 1529.0 | 1523.2 |
| 50°   | 1517.4 | 1523.2 | 1546.3 | 1575.3 | 1604.3 | 1610.1 | 1604.3 | 1569.5 | 1546.3 | 1517.4 | 1517.4 |
| 52.5° | 1523.2 | 1523.2 | 1552.1 | 1598.5 | 1627.4 | 1639.0 | 1627.4 | 1598.5 | 1546.3 | 1517.4 | 1517.4 |
| 55°   | 1511.6 | 1505.8 | 1546.3 | 1598.5 | 1644.8 | 1668.0 | 1644.8 | 1598.5 | 1540.6 | 1505.8 | 1500.0 |
| 57.5° | 1459.5 | 1459.5 | 1511.6 | 1563.7 | 1621.6 | 1633.2 | 1615.8 | 1563.7 | 1505.8 | 1459.5 | 1447.9 |
| 60°   | 1390.0 | 1395.8 | 1447.9 | 1505.8 | 1557.9 | 1563.7 | 1552.1 | 1505.8 | 1447.9 | 1395.8 | 1378.4 |
| 62.5° | 1314.7 | 1326.3 | 1378.4 | 1436.3 | 1500.0 | 1511.6 | 1494.2 | 1436.3 | 1366.8 | 1332.1 | 1303.1 |
| 65°   | 1204.6 | 1222.0 | 1279.9 | 1343.6 | 1413.1 | 1407.3 | 1407.3 | 1337.9 | 1285.7 | 1227.8 | 1198.9 |
| 67.5° | 1083.0 | 1100.4 | 1140.9 | 1227.8 | 1285.7 | 1279.9 | 1274.1 | 1227.8 | 1140.9 | 1100.4 | 1083.0 |
| 70°   | 949.8  | 961.4  | 1001.9 | 1088.8 | 1140.9 | 1146.7 | 1129.4 | 1083.0 | 1001.9 | 973.0  | 944.0  |
| 72.5° | 793.4  | 799.2  | 857.2  | 926.6  | 978.8  | 973.0  | 967.2  | 926.6  | 851.4  | 822.4  | 787.7  |
| 75°   | 625.5  | 631.3  | 683.4  | 747.1  | 787.7  | 781.9  | 776.1  | 747.1  | 683.4  | 648.7  | 619.7  |
| 77.5° | 469.1  | 463.3  | 515.4  | 561.8  | 584.9  | 590.7  | 579.2  | 556.0  | 509.7  | 480.7  | 463.3  |
| 80°   | 307.0  | 301.2  | 347.5  | 382.2  | 399.6  | 399.6  | 393.8  | 376.5  | 341.7  | 318.5  | 307.0  |
| 82.5° | 173.7  | 168.0  | 196.9  | 220.1  | 237.5  | 231.7  | 225.9  | 214.3  | 196.9  | 179.5  | 168.0  |
| 85°   | 63.7   | 63.7   | 81.1   | 92.7   | 104.2  | 104.2  | 98.5   | 92.7   | 75.3   | 69.5   | 63.7   |
| 87.5° | 5.8    | 5.8    | 11.6   | 17.4   | 17.4   | 17.4   | 11.6   | 11.6   | 5.8    | 5.8    | 5.8    |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

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



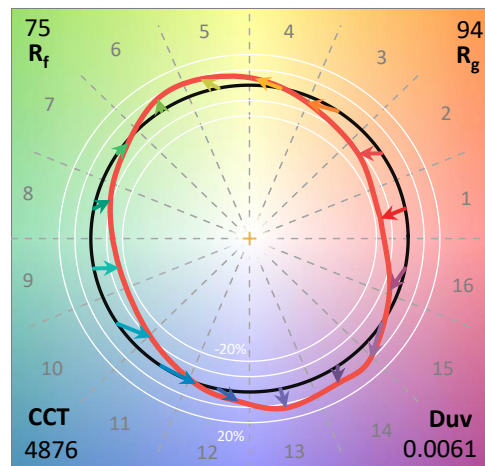
**Test Information**

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**

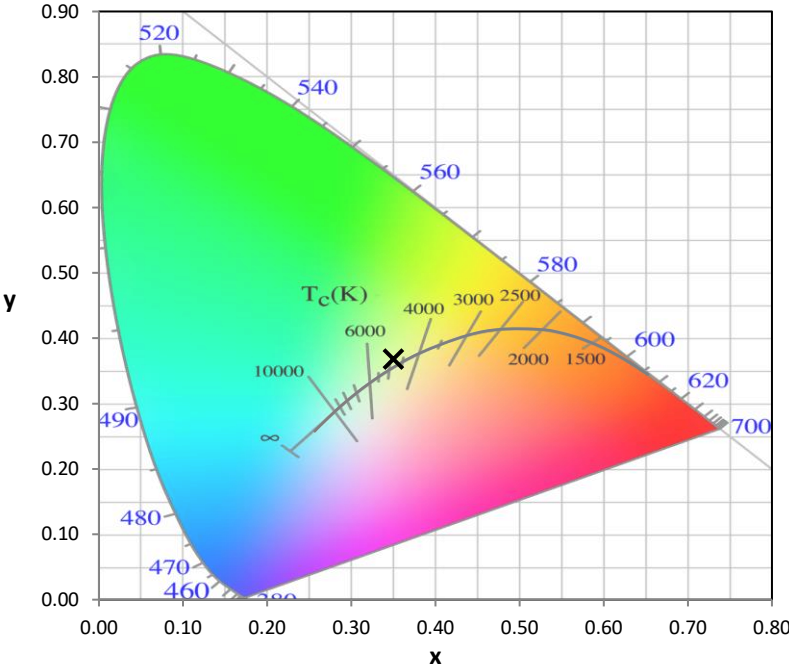
Stabilization Time: 51M  
 Operation Time: 1H 51M  
 Sphere Temperature (°C): 24.9

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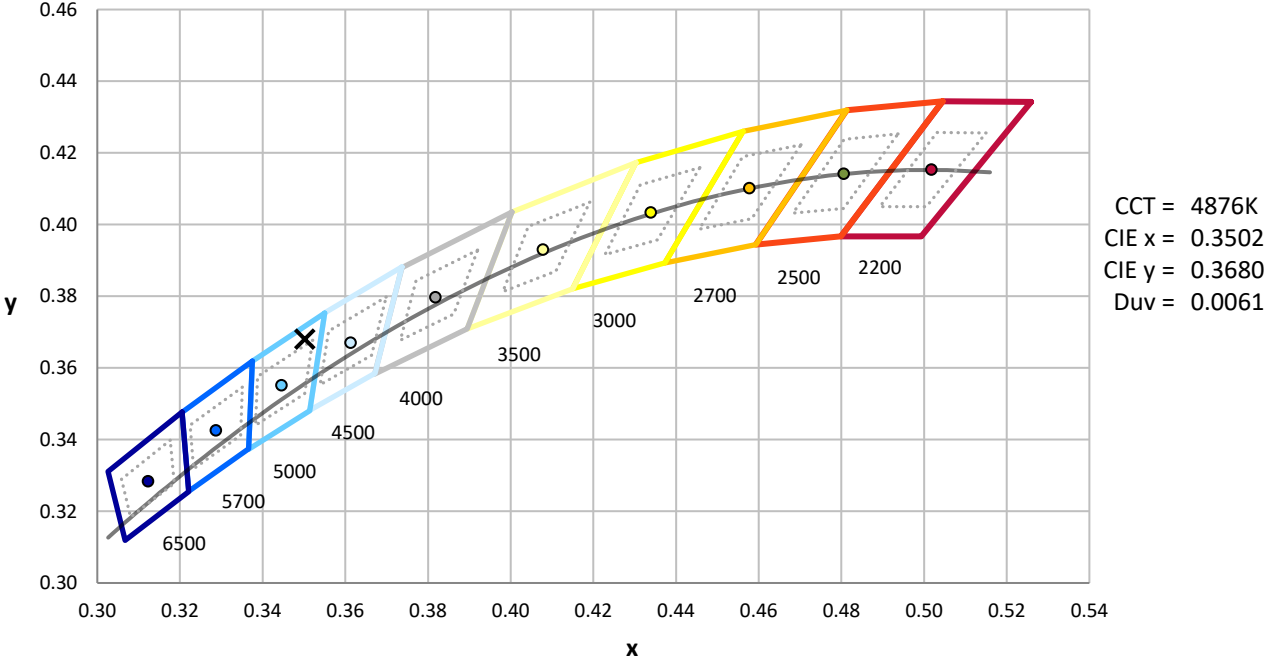
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date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



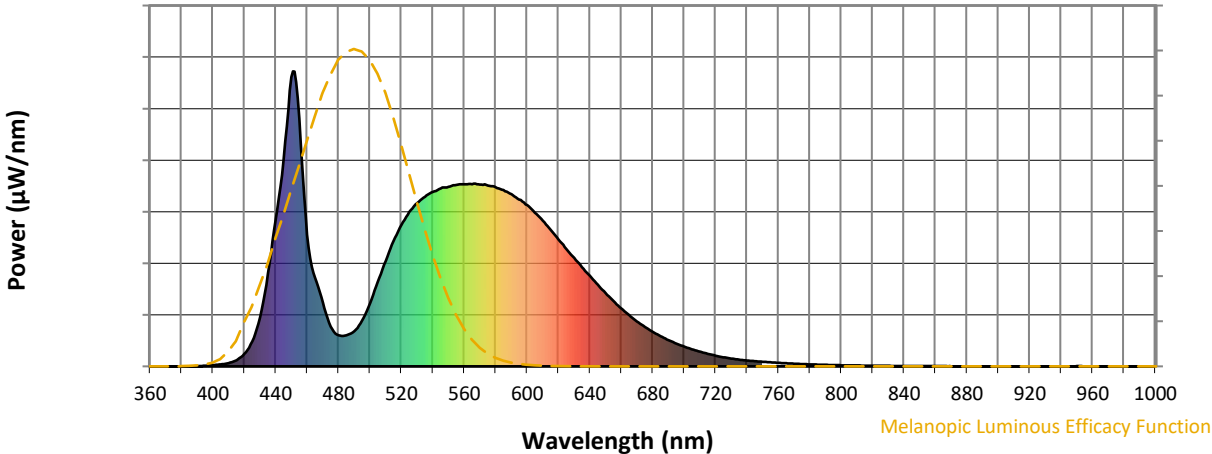
**Scotopic Lumens: NR**

**S/P: 1.74**

| λ (nm) | Power W <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    | 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            |
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| 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            |        |                          |               |

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Melanopic Flux vs. Wavelength

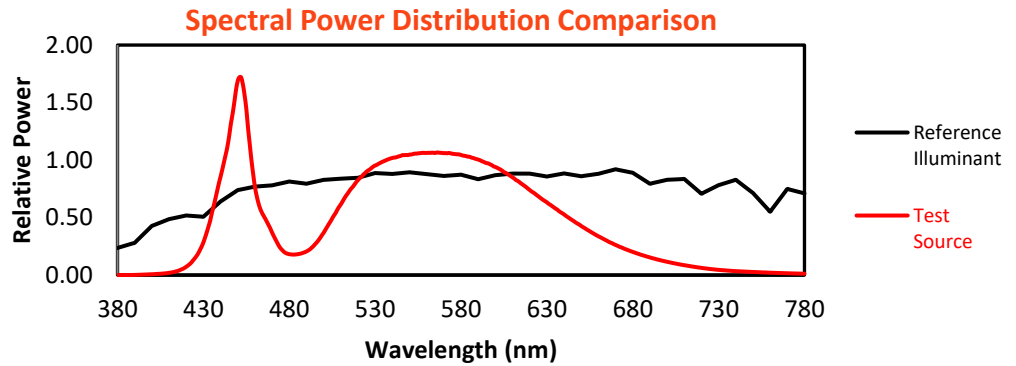


Melanopic Lumens: NR M/P: 3.51

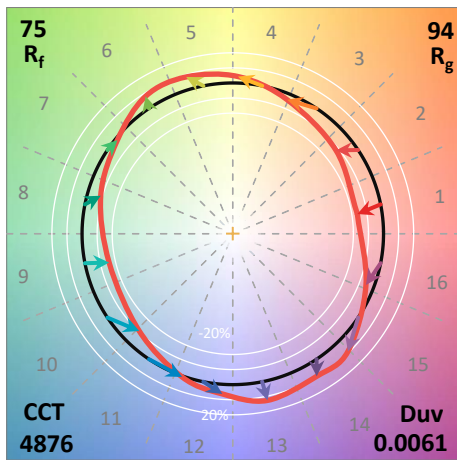
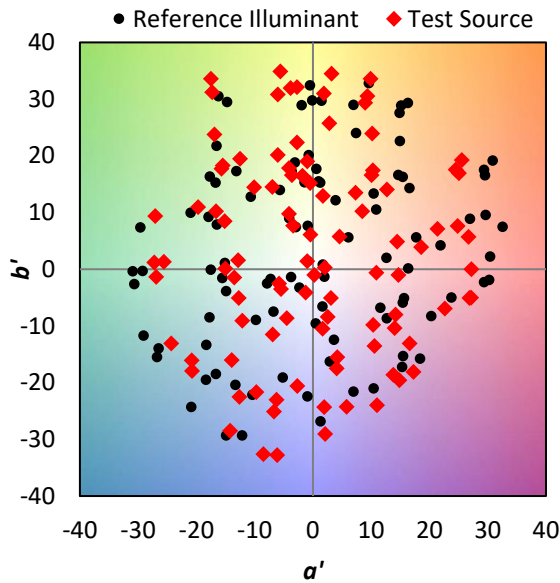
| λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) |
|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|
| 360    | 0                        | NR            | 490    | 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**

$R_f = 74.6$   
 $R_g = 94.4$   
 $CIE R_a = 72.6$   
 $R_9 = -24.6$

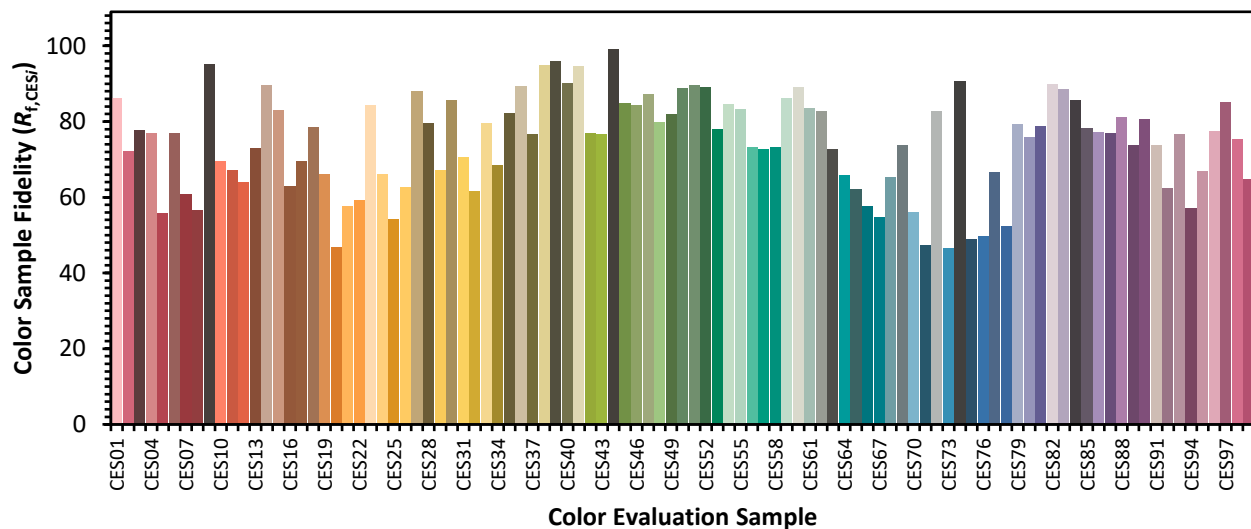


**Color Vector Graphics**



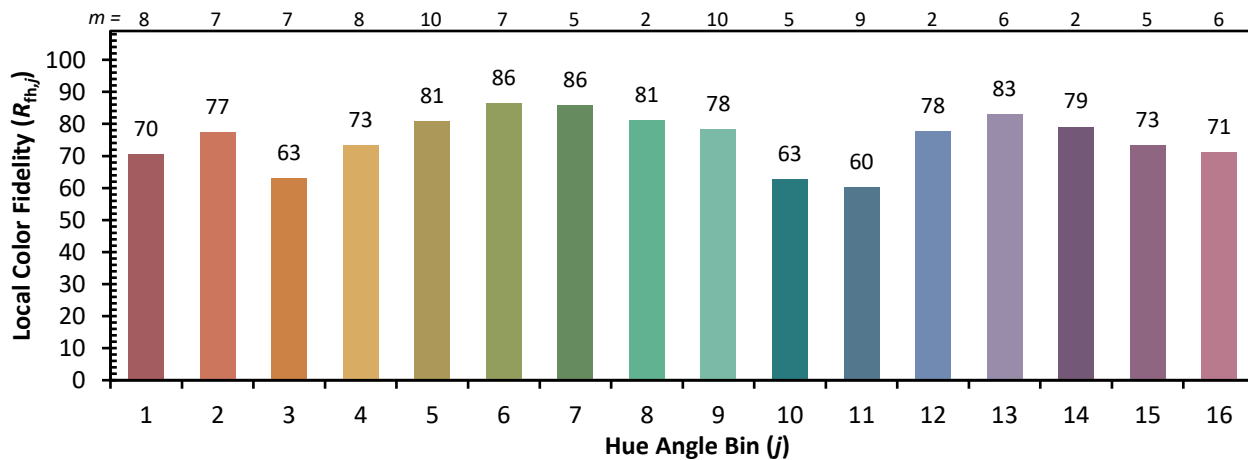
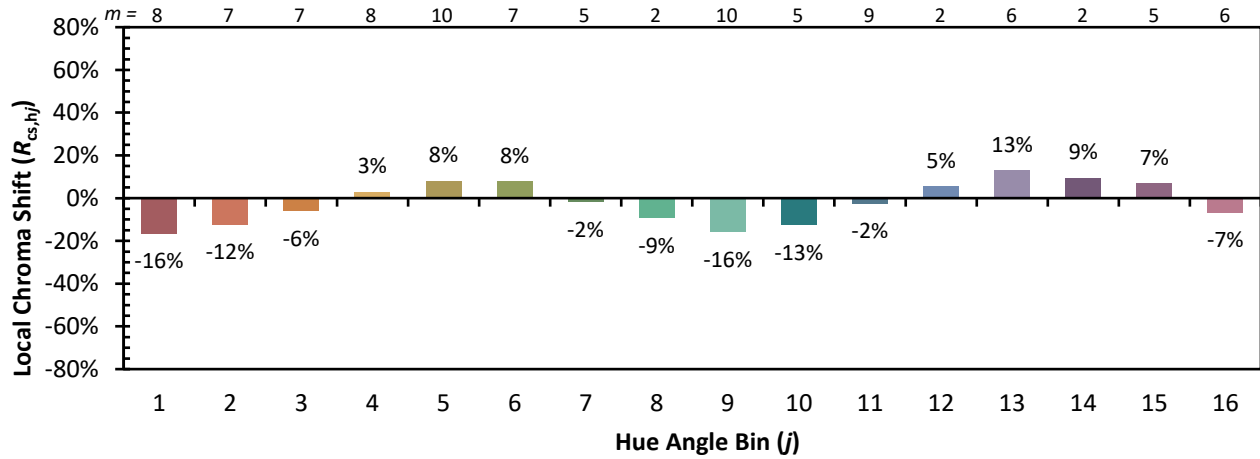
**Individual Sample Fidelity Index ( $R_{f,i}$ )**

|            |            |            |            |
|------------|------------|------------|------------|
| 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)