

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: P832883

Luminaire Tested: **TTN-D0-750-U-WQ-CG-UPL2**

Issue Date: 5/15/2024

**Test Information**

Test Method: LM-79-08  
Report Number: P832883  
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-D0-750-U-WQ-CG-UPL2  
Description: TOPTIER NANO LED PARKING GARAGE LUMINAIRE WITH UPLIGHT  
5000K, 70 CRI LEDS AND WIDE DISTRIBUTION WITH CLEAR GLASS  
Light Source: -  
Ballast/Driver: -

**Summary**

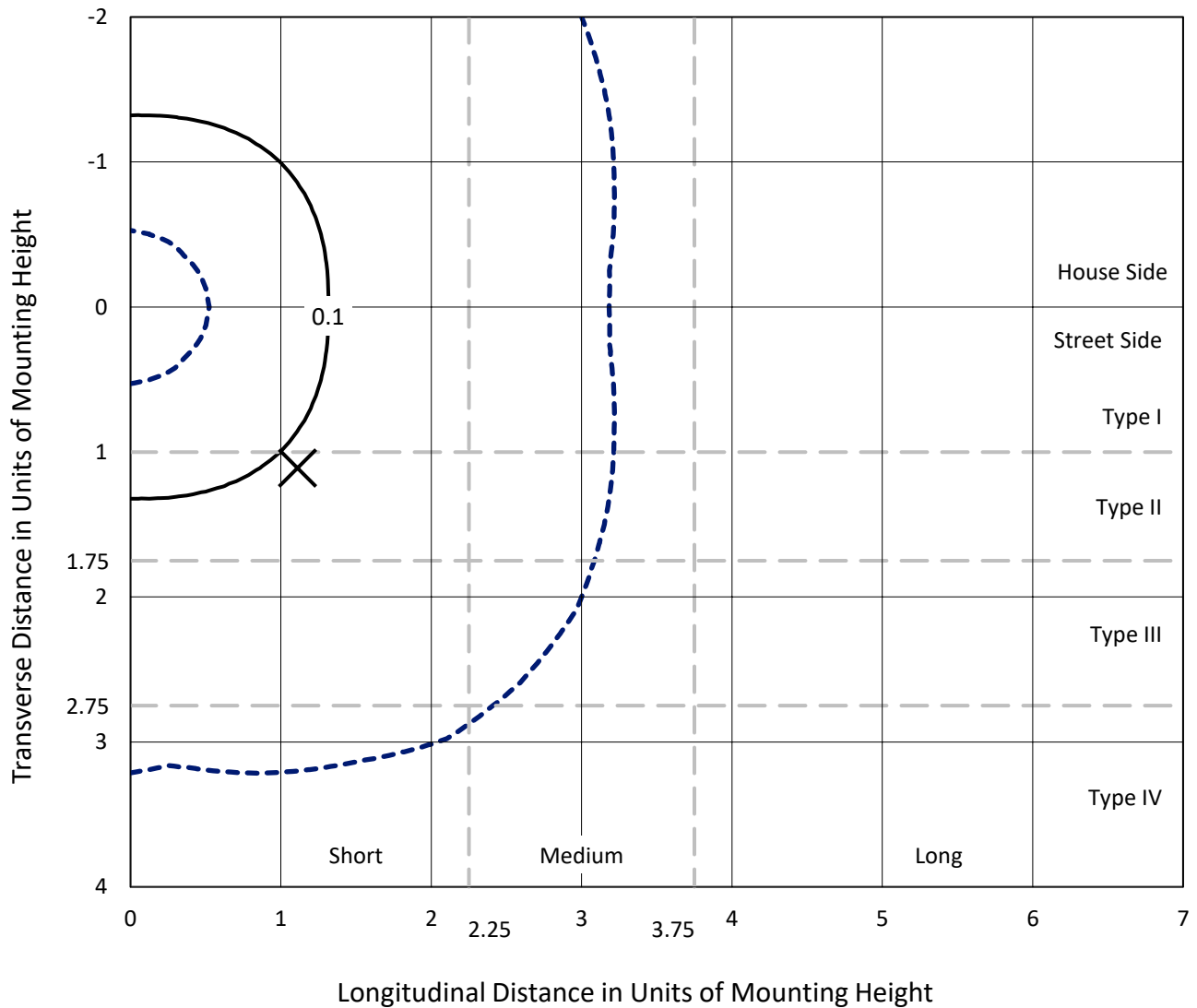
Lumens per Lamp: N/A  
Luminaire Lumens: 1739.5 lumens  
Efficiency: N/A  
Efficacy: 114.4 lumens/watt  
Luminous Opening: Vertical Cylinder (Dia: 0.71' x H: 0.1')  
IES Classification: Type V - Short  
BUG Rating: B1 - U4 - G1  
  
Input Watts (W): 15.2  
Input Voltage (V): NR  
Input Current (Ain): 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: P832883  
 CATALOG NUMBER: TTN-D0-750-U-WQ-CG-UPL2

### Iso-Footcandle Lines of Horizontal Illumination

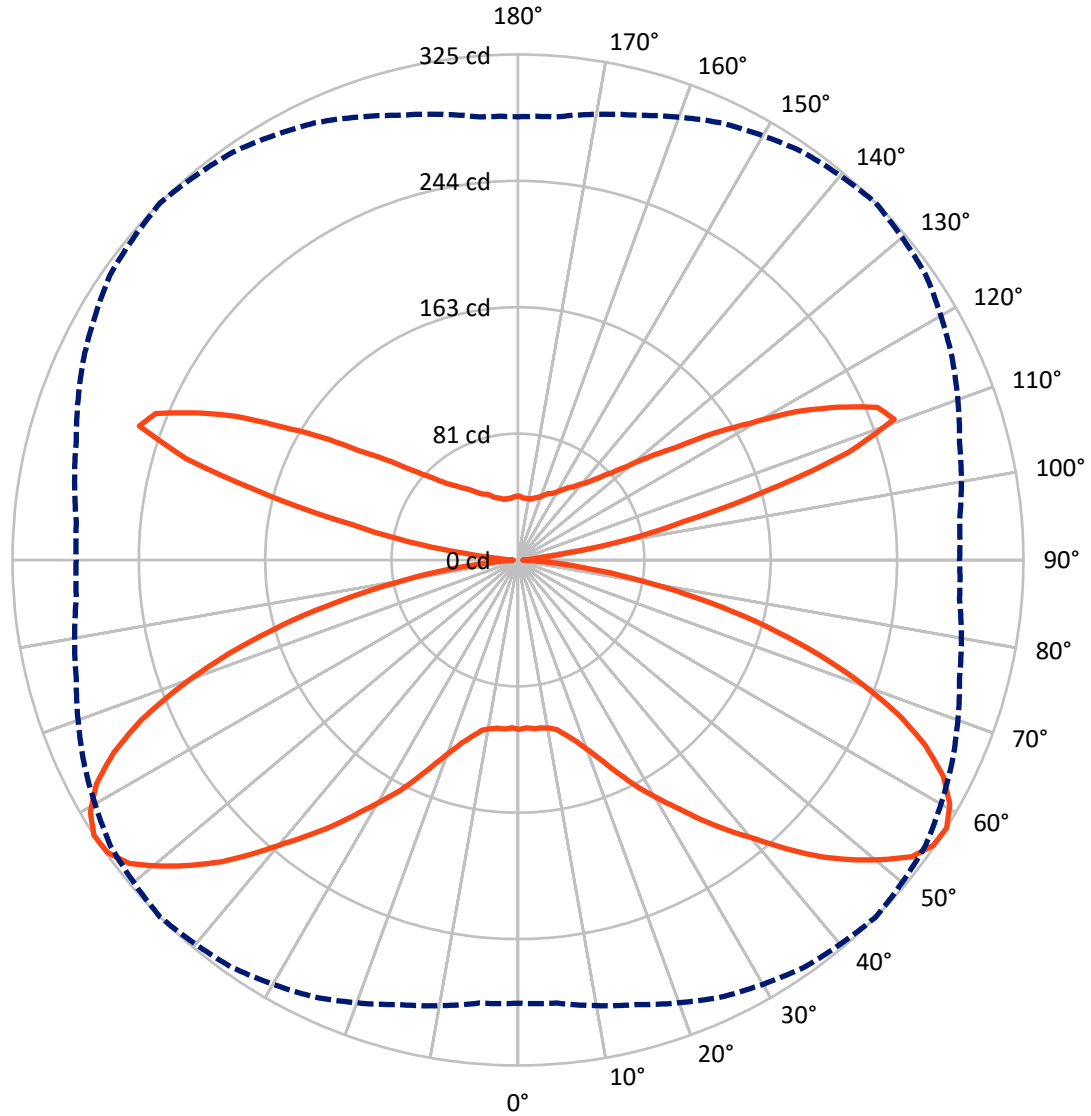
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 0.2 fc  
 Type V - Short - N/A

REPORT NUMBER: P832883  
CATALOG NUMBER: TTN-D0-750-U-WQ-CG-UPL2

### Luminous Intensity Polar Plot



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

REPORT NUMBER: P832883  
 CATALOG NUMBER: TTN-D0-750-U-WQ-CG-UPL2

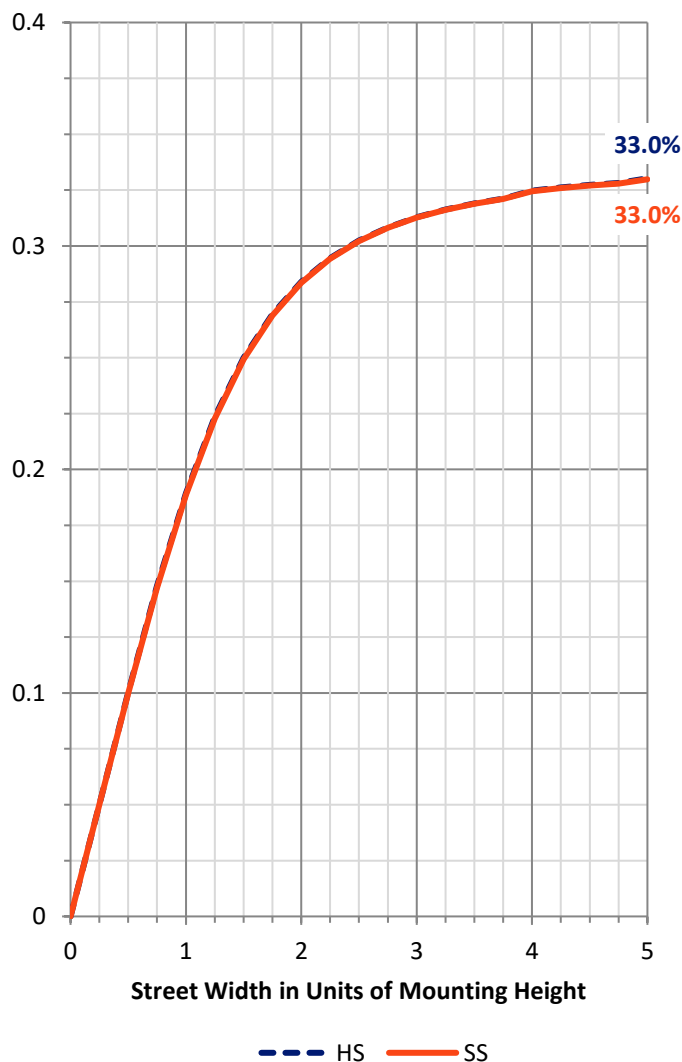
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 577.3    | 292.5  | 869.8  |
|                    | % Fixture | 33.2     | 16.8   | 50.0   |
| <b>Street Side</b> | Lumens    | 577.3    | 292.5  | 869.8  |
|                    | % Fixture | 33.2     | 16.8   | 50.0   |
| <b>Total</b>       | Lumens    | 1154.6   | 584.9  | 1739.5 |
|                    | % Fixture | 66.4     | 33.6   | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 10.4   | 0.6       |
| 10°-20°   | 33.6   | 1.9       |
| 20°-30°   | 70.7   | 4.1       |
| 30°-40°   | 127.5  | 7.3       |
| 40°-50°   | 202.6  | 11.6      |
| 50°-60°   | 270.4  | 15.5      |
| 60°-70°   | 261.2  | 15.0      |
| 70°-80°   | 151.4  | 8.7       |
| 80°-90°   | 26.9   | 1.5       |
| 90°-100°  | 13.1   | 0.8       |
| 100°-110° | 132.7  | 7.6       |
| 110°-120° | 194.0  | 11.2      |
| 120°-130° | 112.6  | 6.5       |
| 130°-140° | 59.7   | 3.4       |
| 140°-150° | 35.4   | 2.0       |
| 150°-160° | 21.8   | 1.3       |
| 160°-170° | 11.9   | 0.7       |
| 170°-180° | 3.9    | 0.2       |
| 0°-90°    | 1154.6 | 66.4      |
| 0°-180°   | 1739.5 | 100.0     |

**Coefficient of Utilization**



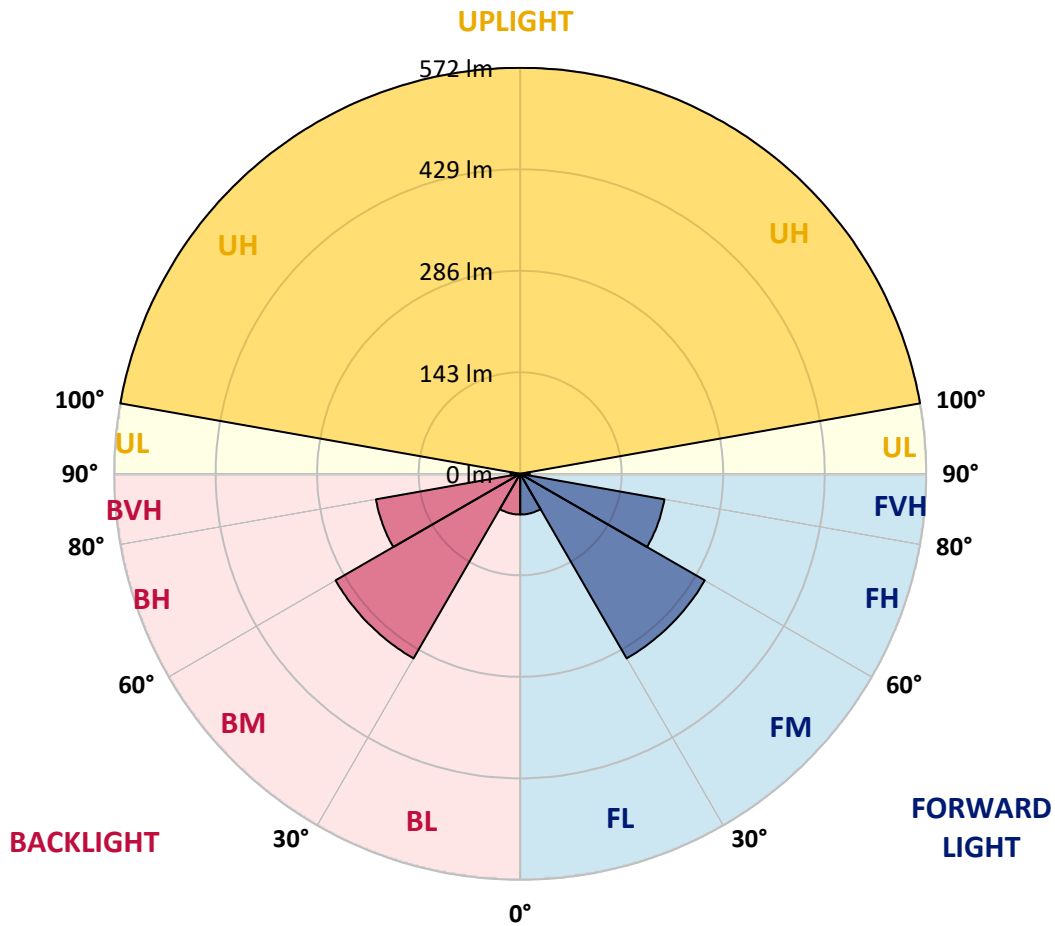
REPORT NUMBER: P832883  
 CATALOG NUMBER: TTN-D0-750-U-WQ-CG-UPL2

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

| Zone           | Lumens | % Fixture | Zone Rating/Lumen Limit |         |        |
|----------------|--------|-----------|-------------------------|---------|--------|
|                |        |           | B                       | U       | G      |
| FL (0°-30°)    | 57.4   | 3.3       |                         |         |        |
| FM (30°-60°)   | 300.2  | 17.3      |                         |         |        |
| FH (60°-80°)   | 206.3  | 11.9      |                         |         | G0/660 |
| FVH (80°-90°)  | 13.4   | 0.8       |                         |         | G1/100 |
| BL (0°-30°)    | 57.4   | 3.3       | B0/110                  |         |        |
| BM (30°-60°)   | 300.2  | 17.3      | B1/1000                 |         |        |
| BH (60°-80°)   | 206.3  | 11.9      | B1/500                  |         | G0/660 |
| BVH (80°-90°)  | 13.4   | 0.8       |                         |         | G1/100 |
| UL (90°-100°)  | 13.1   | 0.8       |                         | U2/50   |        |
| UH (100°-180°) | 571.8  | 32.9      |                         | U4/1000 |        |

**BUG Rating: B1-U4-G1**

Type V Short





REPORT NUMBER: P832883

CATALOG NUMBER: TTN-D0-750-U-WQ-CG-UPL2

**CANDELA DISTRIBUTION (FULL):**

|        | 0°    | 5°    | 15°   | 25°   | 35°   | 45°   | 55°   | 65°   | 75°   | 85°   | 90°   |
|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°     | 109.0 | 109.0 | 109.0 | 109.0 | 109.0 | 109.0 | 109.0 | 109.0 | 109.0 | 109.0 | 109.0 |
| 2.5°   | 108.0 | 108.0 | 108.0 | 108.0 | 108.0 | 108.0 | 108.0 | 108.0 | 108.0 | 108.0 | 108.0 |
| 5°     | 109.0 | 109.0 | 109.0 | 109.0 | 109.0 | 109.0 | 109.0 | 109.0 | 109.0 | 109.0 | 109.0 |
| 7.5°   | 108.0 | 108.0 | 109.0 | 109.0 | 109.0 | 109.0 | 109.0 | 109.0 | 109.0 | 108.0 | 108.0 |
| 10°    | 109.0 | 109.0 | 109.0 | 110.0 | 110.0 | 110.0 | 110.0 | 110.0 | 109.0 | 109.0 | 109.0 |
| 12.5°  | 111.0 | 111.0 | 112.0 | 112.0 | 112.0 | 112.0 | 112.0 | 112.0 | 112.0 | 111.0 | 111.0 |
| 15°    | 116.0 | 116.0 | 116.0 | 117.0 | 117.0 | 117.0 | 117.0 | 117.0 | 116.0 | 116.0 | 116.0 |
| 17.5°  | 121.0 | 121.0 | 122.0 | 122.0 | 123.0 | 123.0 | 123.0 | 122.0 | 122.0 | 122.0 | 122.0 |
| 20°    | 128.0 | 128.0 | 129.0 | 129.0 | 130.0 | 131.0 | 131.0 | 130.0 | 129.0 | 129.0 | 129.0 |
| 22.5°  | 137.0 | 138.0 | 138.0 | 138.0 | 139.0 | 141.0 | 140.0 | 139.0 | 138.0 | 138.0 | 138.0 |
| 25°    | 148.0 | 149.0 | 150.0 | 150.0 | 151.0 | 153.0 | 153.0 | 150.0 | 150.0 | 150.0 | 150.0 |
| 27.5°  | 161.0 | 162.0 | 163.0 | 163.0 | 164.0 | 166.0 | 165.0 | 163.0 | 163.0 | 162.0 | 162.0 |
| 30°    | 173.0 | 174.0 | 175.0 | 176.0 | 177.0 | 178.0 | 178.0 | 176.0 | 175.0 | 174.0 | 173.0 |
| 32.5°  | 185.0 | 185.0 | 187.0 | 189.0 | 191.0 | 191.0 | 192.0 | 189.0 | 187.0 | 185.0 | 184.0 |
| 35°    | 197.0 | 198.0 | 199.0 | 202.0 | 205.0 | 206.0 | 205.0 | 202.0 | 199.0 | 197.0 | 197.0 |
| 37.5°  | 210.0 | 211.0 | 212.0 | 216.0 | 219.0 | 221.0 | 219.0 | 216.0 | 212.0 | 210.0 | 209.0 |
| 40°    | 224.0 | 225.0 | 226.0 | 231.0 | 234.0 | 236.0 | 233.0 | 230.0 | 226.0 | 224.0 | 223.0 |
| 42.5°  | 237.0 | 239.0 | 241.0 | 247.0 | 252.0 | 254.0 | 251.0 | 246.0 | 242.0 | 237.0 | 236.0 |
| 45°    | 253.0 | 255.0 | 258.0 | 264.0 | 269.0 | 272.0 | 268.0 | 263.0 | 257.0 | 253.0 | 252.0 |
| 47.5°  | 266.0 | 268.0 | 271.0 | 279.0 | 286.0 | 288.0 | 284.0 | 278.0 | 270.0 | 265.0 | 264.0 |
| 50°    | 276.0 | 278.0 | 284.0 | 293.0 | 301.0 | 303.0 | 299.0 | 291.0 | 282.0 | 275.0 | 274.0 |
| 52.5°  | 284.0 | 286.0 | 293.0 | 305.0 | 314.0 | 317.0 | 312.0 | 303.0 | 291.0 | 283.0 | 282.0 |
| 55°    | 288.0 | 289.0 | 298.0 | 311.0 | 320.0 | 324.0 | 319.0 | 309.0 | 296.0 | 287.0 | 286.0 |
| 57.5°  | 285.0 | 286.0 | 296.0 | 310.0 | 320.0 | 325.0 | 320.0 | 308.0 | 294.0 | 285.0 | 284.0 |
| 60°    | 279.0 | 279.0 | 288.0 | 304.0 | 316.0 | 319.0 | 314.0 | 302.0 | 287.0 | 278.0 | 277.0 |
| 62.5°  | 268.0 | 267.0 | 278.0 | 292.0 | 304.0 | 307.0 | 303.0 | 291.0 | 276.0 | 267.0 | 266.0 |
| 65°    | 247.0 | 245.0 | 261.0 | 274.0 | 285.0 | 288.0 | 285.0 | 274.0 | 260.0 | 246.0 | 244.0 |
| 67.5°  | 222.0 | 219.0 | 234.0 | 249.0 | 259.0 | 263.0 | 259.0 | 250.0 | 234.0 | 220.0 | 219.0 |
| 70°    | 196.0 | 193.0 | 205.0 | 218.0 | 229.0 | 231.0 | 227.0 | 218.0 | 203.0 | 194.0 | 194.0 |
| 72.5°  | 165.0 | 162.0 | 173.0 | 183.0 | 194.0 | 196.0 | 192.0 | 184.0 | 173.0 | 164.0 | 163.0 |
| 75°    | 131.0 | 128.0 | 138.0 | 146.0 | 157.0 | 158.0 | 156.0 | 147.0 | 138.0 | 129.0 | 129.0 |
| 77.5°  | 97.0  | 94.0  | 102.0 | 109.0 | 118.0 | 118.0 | 117.0 | 110.0 | 102.0 | 96.0  | 96.0  |
| 80°    | 64.0  | 62.0  | 69.0  | 72.0  | 80.0  | 80.0  | 79.0  | 74.0  | 68.0  | 64.0  | 63.0  |
| 82.5°  | 36.0  | 34.0  | 40.0  | 41.0  | 47.0  | 47.0  | 46.0  | 42.0  | 38.0  | 35.0  | 35.0  |
| 85°    | 14.0  | 12.0  | 16.0  | 17.0  | 20.0  | 20.0  | 19.0  | 18.0  | 15.0  | 13.0  | 13.0  |
| 87.5°  | 1.0   | 1.0   | 2.0   | 2.0   | 3.0   | 3.0   | 3.0   | 2.0   | 2.0   | 1.0   | 1.0   |
| 90°    | 5.0   | 5.0   | 6.0   | 6.0   | 6.0   | 6.0   | 6.0   | 6.0   | 6.0   | 5.0   | 5.0   |
| 92.5°  | 5.0   | 5.0   | 5.0   | 7.0   | 8.0   | 7.0   | 8.0   | 6.0   | 6.0   | 5.0   | 5.0   |
| 95°    | 6.0   | 6.0   | 7.0   | 9.0   | 11.0  | 12.0  | 12.0  | 7.0   | 7.0   | 6.0   | 6.0   |
| 97.5°  | 8.0   | 9.0   | 9.0   | 11.0  | 18.0  | 33.0  | 20.0  | 10.0  | 10.0  | 9.0   | 8.0   |
| 100°   | 13.0  | 14.0  | 14.0  | 25.0  | 53.0  | 71.1  | 51.0  | 26.0  | 19.0  | 14.0  | 14.0  |
| 102.5° | 42.0  | 44.0  | 54.0  | 81.1  | 120.1 | 109.1 | 92.1  | 87.1  | 60.0  | 48.0  | 46.0  |
| 105°   | 107.1 | 106.1 | 114.1 | 135.1 | 168.1 | 165.1 | 152.1 | 138.1 | 119.1 | 110.1 | 110.1 |
| 107.5° | 141.1 | 141.1 | 148.1 | 166.1 | 191.1 | 223.2 | 226.2 | 179.1 | 157.1 | 147.1 | 146.1 |
| 110°   | 159.1 | 159.1 | 165.1 | 180.1 | 213.2 | 258.2 | 256.2 | 221.2 | 194.1 | 181.1 | 179.1 |



REPORT NUMBER: P832883  
 CATALOG NUMBER: TTN-D0-750-U-WQ-CG-UPL2

**CANDELA DISTRIBUTION (continued):**

|        | 0°    | 5°    | 15°   | 25°   | 35°   | 45°   | 55°   | 65°   | 75°   | 85°   | 90°   |
|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 112.5° | 163.1 | 164.1 | 172.1 | 195.1 | 231.2 | 251.2 | 242.2 | 228.2 | 216.2 | 206.2 | 204.2 |
| 115°   | 169.1 | 169.1 | 178.1 | 200.2 | 220.2 | 228.2 | 218.2 | 207.2 | 199.2 | 195.1 | 197.1 |
| 117.5° | 167.1 | 170.1 | 172.1 | 184.1 | 197.1 | 203.2 | 198.1 | 183.1 | 177.1 | 175.1 | 172.1 |
| 120°   | 155.1 | 155.1 | 157.1 | 163.1 | 170.1 | 173.1 | 171.1 | 161.1 | 156.1 | 155.1 | 153.1 |
| 122.5° | 138.1 | 139.1 | 138.1 | 141.1 | 146.1 | 149.1 | 147.1 | 139.1 | 137.1 | 137.1 | 135.1 |
| 125°   | 121.1 | 121.1 | 120.1 | 122.1 | 125.1 | 124.1 | 125.1 | 121.1 | 120.1 | 120.1 | 119.1 |
| 127.5° | 109.1 | 108.1 | 106.1 | 107.1 | 108.1 | 108.1 | 109.1 | 105.1 | 106.1 | 107.1 | 106.1 |
| 130°   | 97.1  | 97.1  | 95.1  | 95.1  | 95.1  | 93.1  | 95.1  | 93.1  | 94.1  | 95.1  | 96.1  |
| 132.5° | 86.1  | 86.1  | 83.1  | 82.1  | 82.1  | 82.1  | 83.1  | 82.1  | 84.1  | 86.1  | 86.1  |
| 135°   | 77.1  | 77.1  | 74.1  | 75.1  | 75.1  | 74.1  | 75.1  | 74.1  | 76.1  | 77.1  | 77.1  |
| 137.5° | 70.1  | 70.1  | 68.1  | 68.1  | 68.1  | 67.1  | 68.1  | 68.1  | 69.1  | 71.1  | 72.1  |
| 140°   | 64.0  | 64.0  | 63.0  | 63.0  | 62.0  | 63.0  | 63.0  | 63.0  | 64.0  | 65.0  | 65.0  |
| 142.5° | 61.0  | 60.0  | 59.0  | 58.0  | 59.0  | 59.0  | 59.0  | 58.0  | 59.0  | 61.0  | 61.0  |
| 145°   | 56.0  | 56.0  | 55.0  | 55.0  | 55.0  | 56.0  | 55.0  | 55.0  | 56.0  | 56.0  | 57.0  |
| 147.5° | 53.0  | 53.0  | 52.0  | 53.0  | 53.0  | 53.0  | 53.0  | 52.0  | 53.0  | 53.0  | 54.0  |
| 150°   | 52.0  | 51.0  | 50.0  | 51.0  | 51.0  | 50.0  | 50.0  | 50.0  | 50.0  | 51.0  | 51.0  |
| 152.5° | 49.0  | 49.0  | 48.0  | 49.0  | 48.0  | 48.0  | 48.0  | 48.0  | 48.0  | 49.0  | 50.0  |
| 155°   | 47.0  | 47.0  | 46.0  | 47.0  | 47.0  | 47.0  | 47.0  | 47.0  | 47.0  | 47.0  | 47.0  |
| 157.5° | 45.0  | 46.0  | 45.0  | 45.0  | 45.0  | 45.0  | 45.0  | 45.0  | 45.0  | 46.0  | 46.0  |
| 160°   | 44.0  | 44.0  | 44.0  | 44.0  | 43.0  | 43.0  | 43.0  | 44.0  | 44.0  | 44.0  | 45.0  |
| 162.5° | 43.0  | 43.0  | 43.0  | 43.0  | 42.0  | 42.0  | 42.0  | 42.0  | 43.0  | 43.0  | 44.0  |
| 165°   | 43.0  | 42.0  | 42.0  | 42.0  | 41.0  | 41.0  | 41.0  | 41.0  | 42.0  | 43.0  | 42.0  |
| 167.5° | 41.0  | 41.0  | 41.0  | 41.0  | 41.0  | 40.0  | 40.0  | 41.0  | 41.0  | 41.0  | 42.0  |
| 170°   | 41.0  | 41.0  | 40.0  | 40.0  | 40.0  | 40.0  | 40.0  | 40.0  | 40.0  | 40.0  | 41.0  |
| 172.5° | 41.0  | 41.0  | 41.0  | 41.0  | 40.0  | 40.0  | 40.0  | 40.0  | 40.0  | 41.0  | 41.0  |
| 175°   | 41.0  | 41.0  | 41.0  | 41.0  | 40.0  | 40.0  | 40.0  | 41.0  | 41.0  | 41.0  | 40.0  |
| 177.5° | 41.0  | 41.0  | 41.0  | 41.0  | 40.0  | 41.0  | 41.0  | 41.0  | 41.0  | 41.0  | 41.0  |
| 180°   | 41.0  | 41.0  | 41.0  | 41.0  | 41.0  | 41.0  | 41.0  | 41.0  | 41.0  | 41.0  | 41.0  |



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**

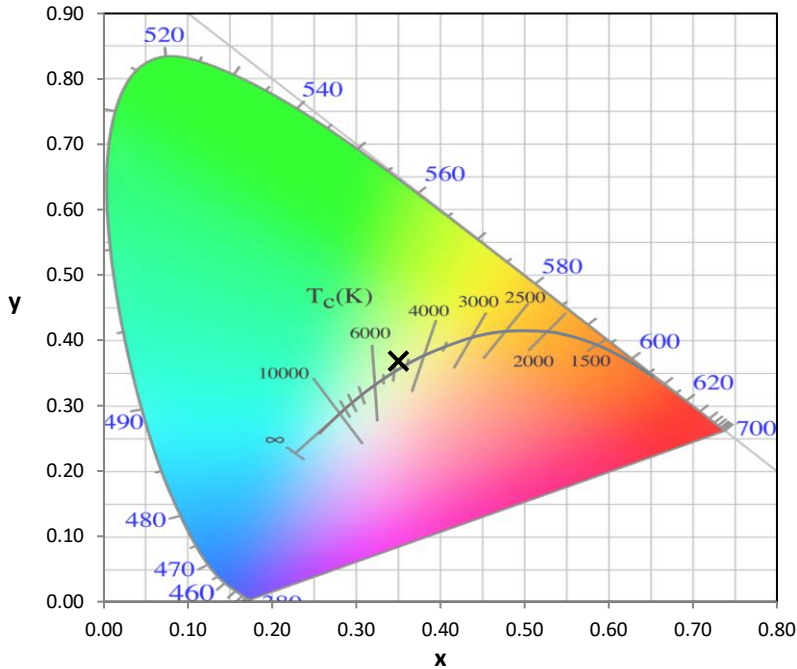
Stabilization Time: 51M  
 Operation Time: 1H 51M  
 Sphere Temperature (°C): 24.9

REPORT NUMBER: SP1-2411-284-3

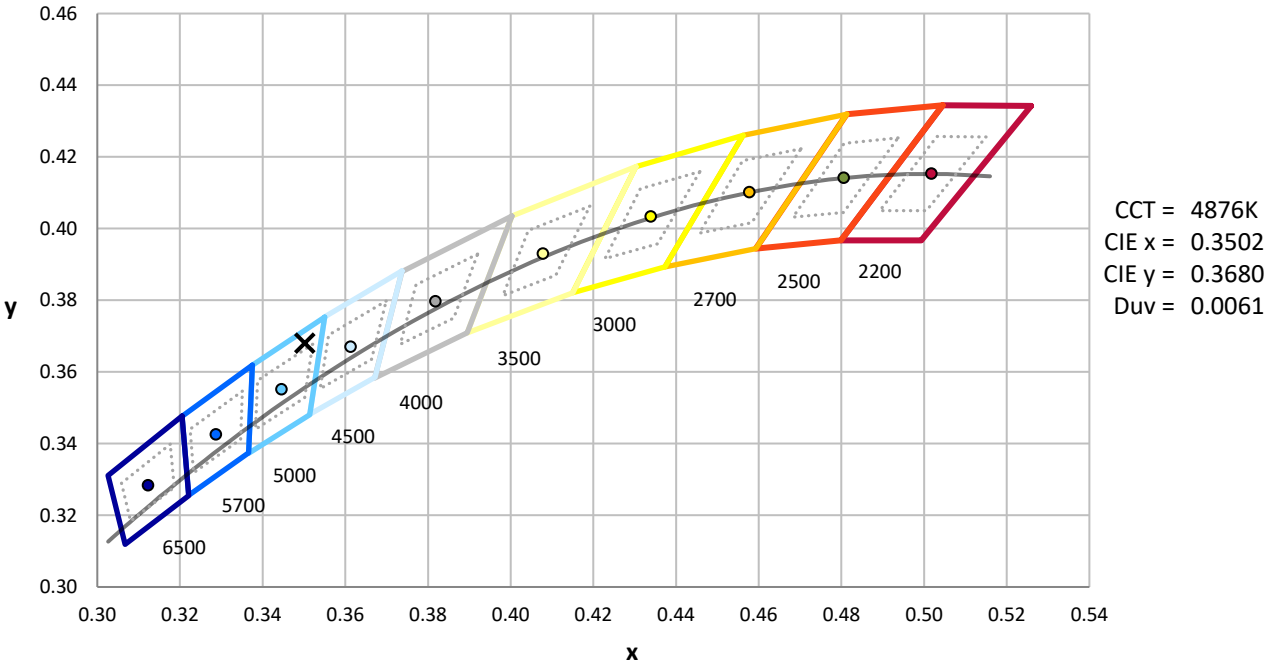
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date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

REPORT NUMBER: SP1-2411-284-3

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

REPORT NUMBER: SP1-2411-284-3

**Photopic Flux vs. Wavelength**

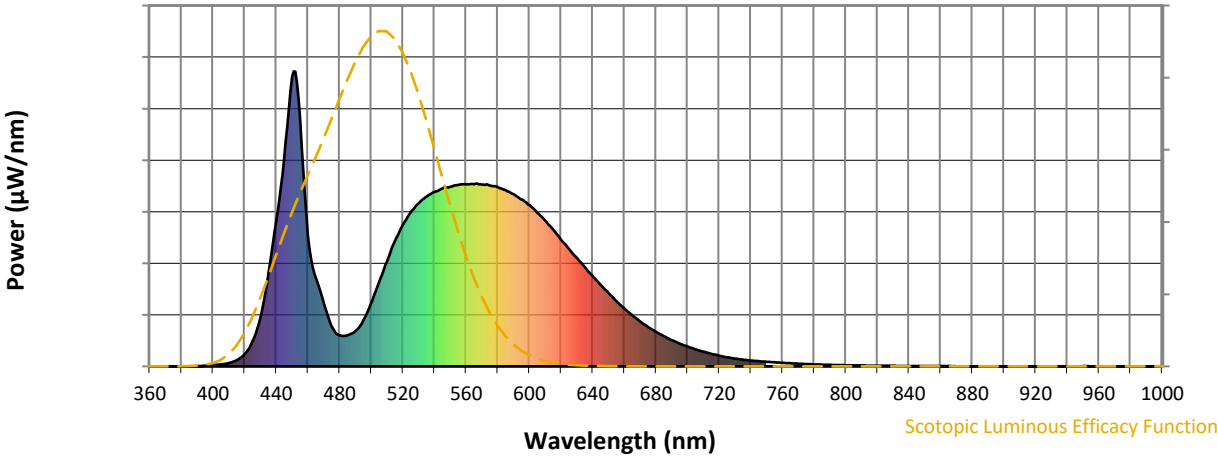


**Photopic Lumens: NR**

| 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**

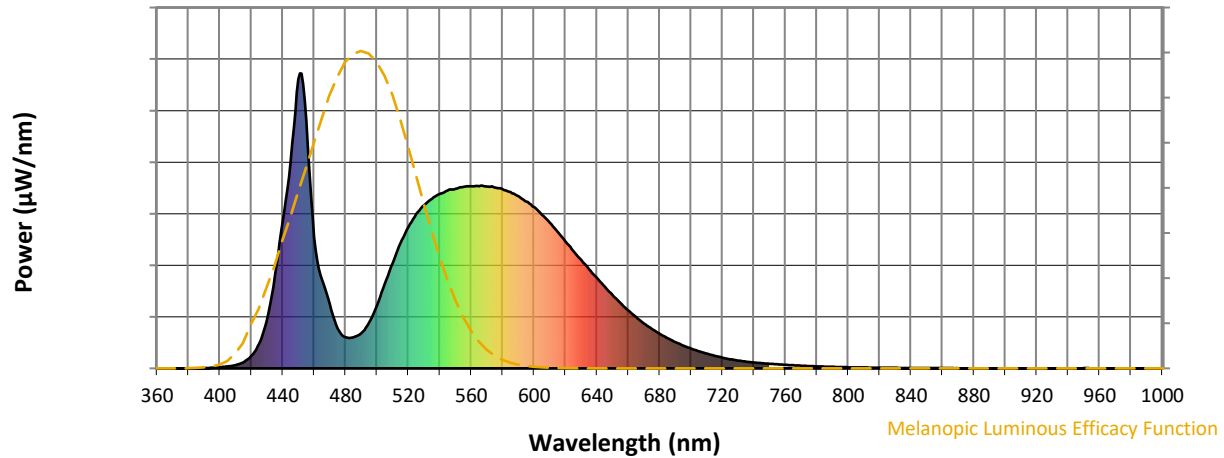


**Scotopic Lumens: NR S/P: 1.74**

| 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            |
| 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**

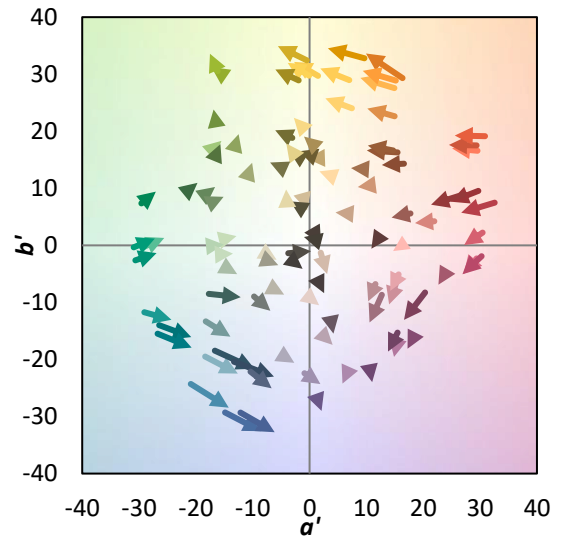
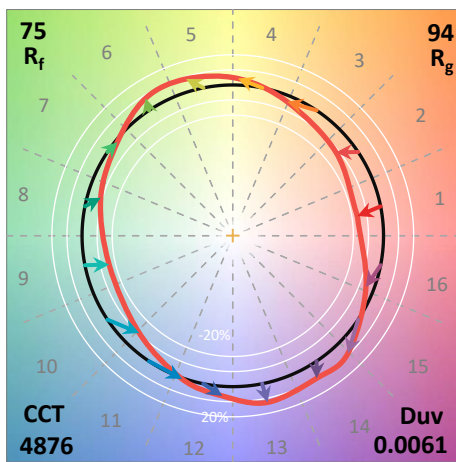
| λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) |
|--------|--------------------------|---------------|--------|--------------------------|-------------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

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



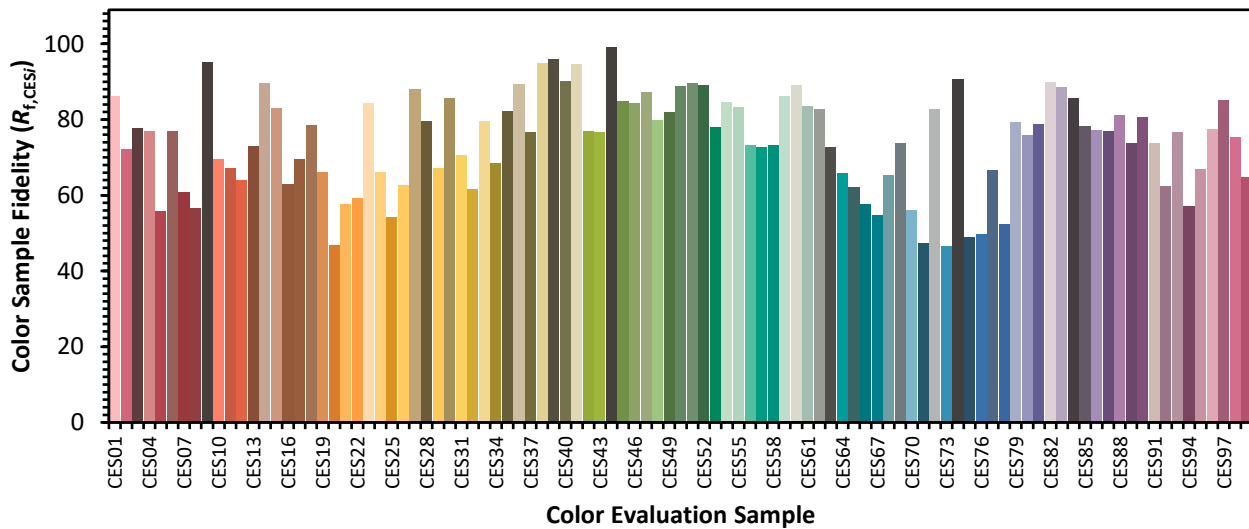
**Color Vector Graphics**



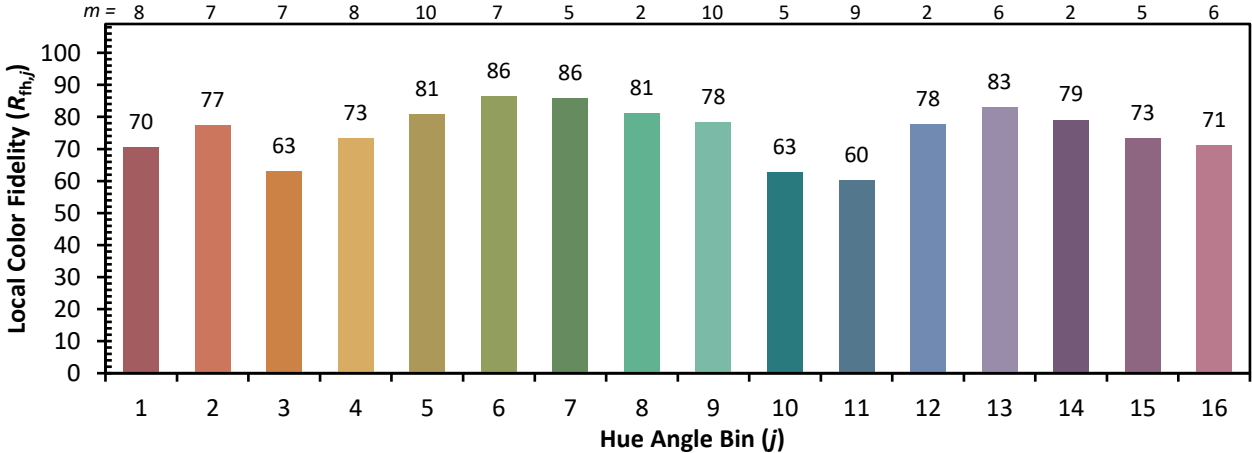


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

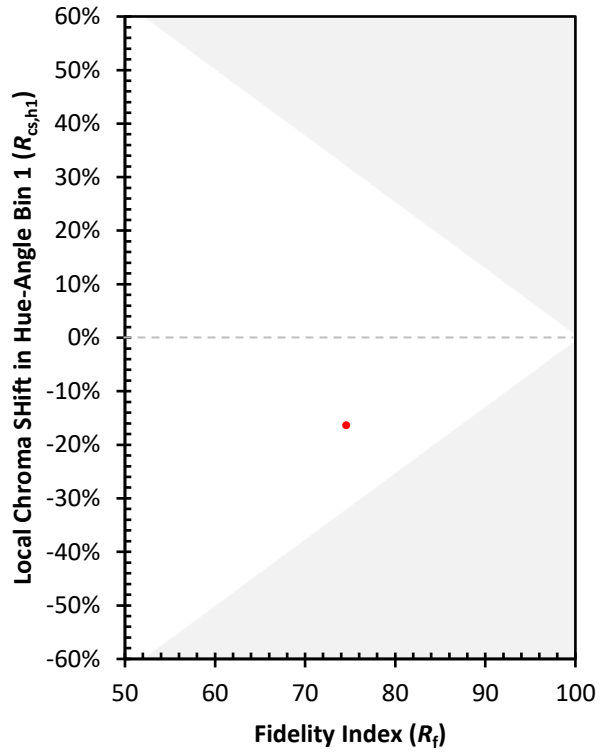
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 63 | CES51 = 90 | CES76 = 50 |
| CES02 = 59 | CES27 = 88 | CES52 = 89 | CES77 = 67 |
| CES03 = 30 | CES28 = 80 | CES53 = 78 | CES78 = 52 |
| CES04 = 69 | CES29 = 67 | CES54 = 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)