

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: P413336

Luminaire Tested: **TT-D6-735-U-RW-PM**

Issue Date: 10/15/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P413336  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2010-981-1)  
Test Lab: INNOVATION CENTER  
Issue Date: 10/15/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: MCGRAW-EDISON  
Catalog Number: TT-D6-735-U-RW-PM  
Description: TOPTIER LED SITE LUMINAIRE  
3500K, 70 CRI LEDS AND RECTANGULAR DISTRIBUTION  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 9471 lumens  
Efficiency: N/A  
Efficacy: 90.0 lumens/watt  
Luminous Opening: Circular (Dia: 1.12' x H: 0')  
IES Classification: Type IV - Short  
BUG Rating: B4 - U0 - G4

Input Watts (W): 105.2  
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: 28.75 FT



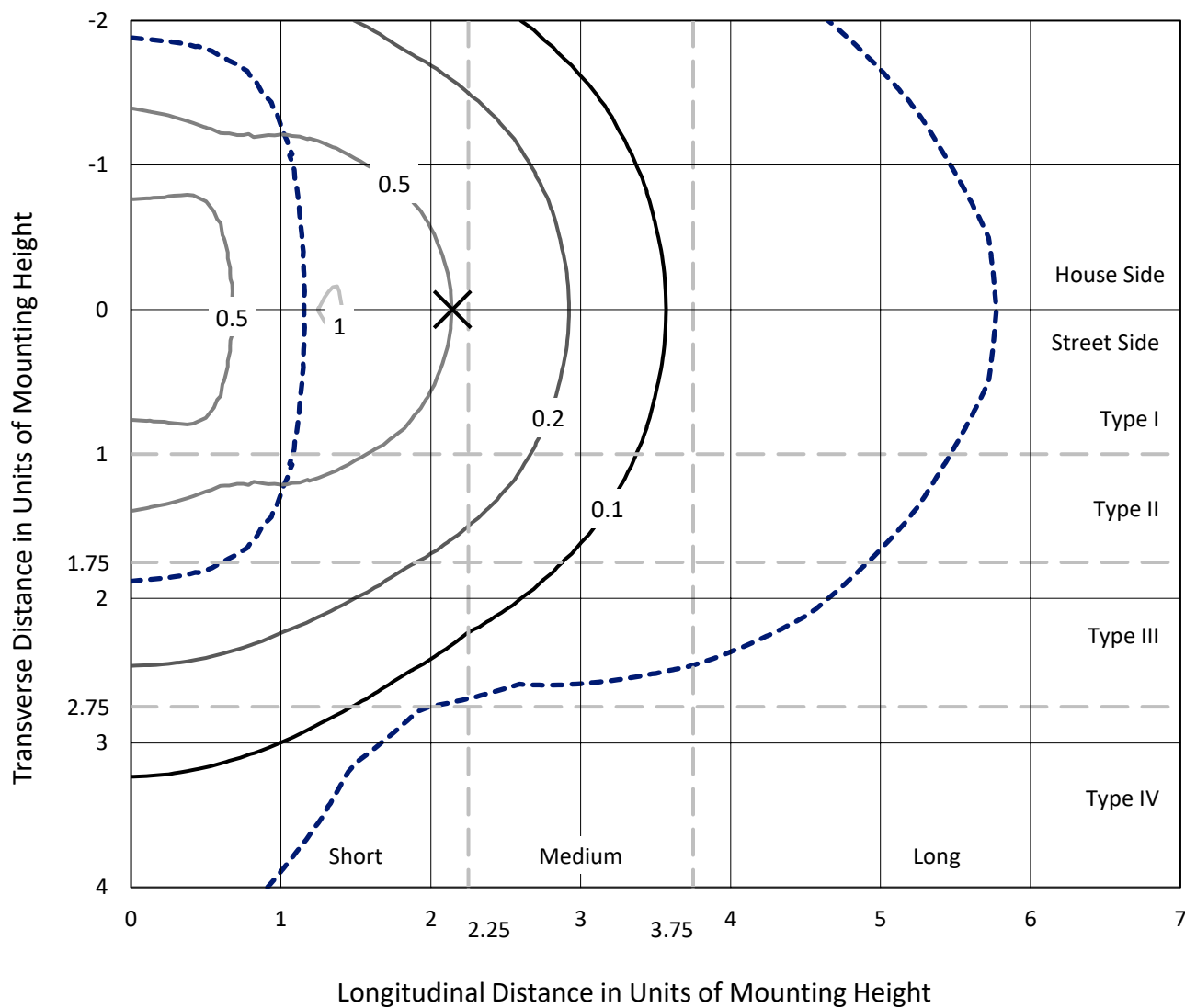
REPORT NUMBER: P413336

CATALOG NUMBER: TT-D6-735-U-RW-PM

## Iso-Footcandle Lines of Horizontal Illumination

✕ Max cd

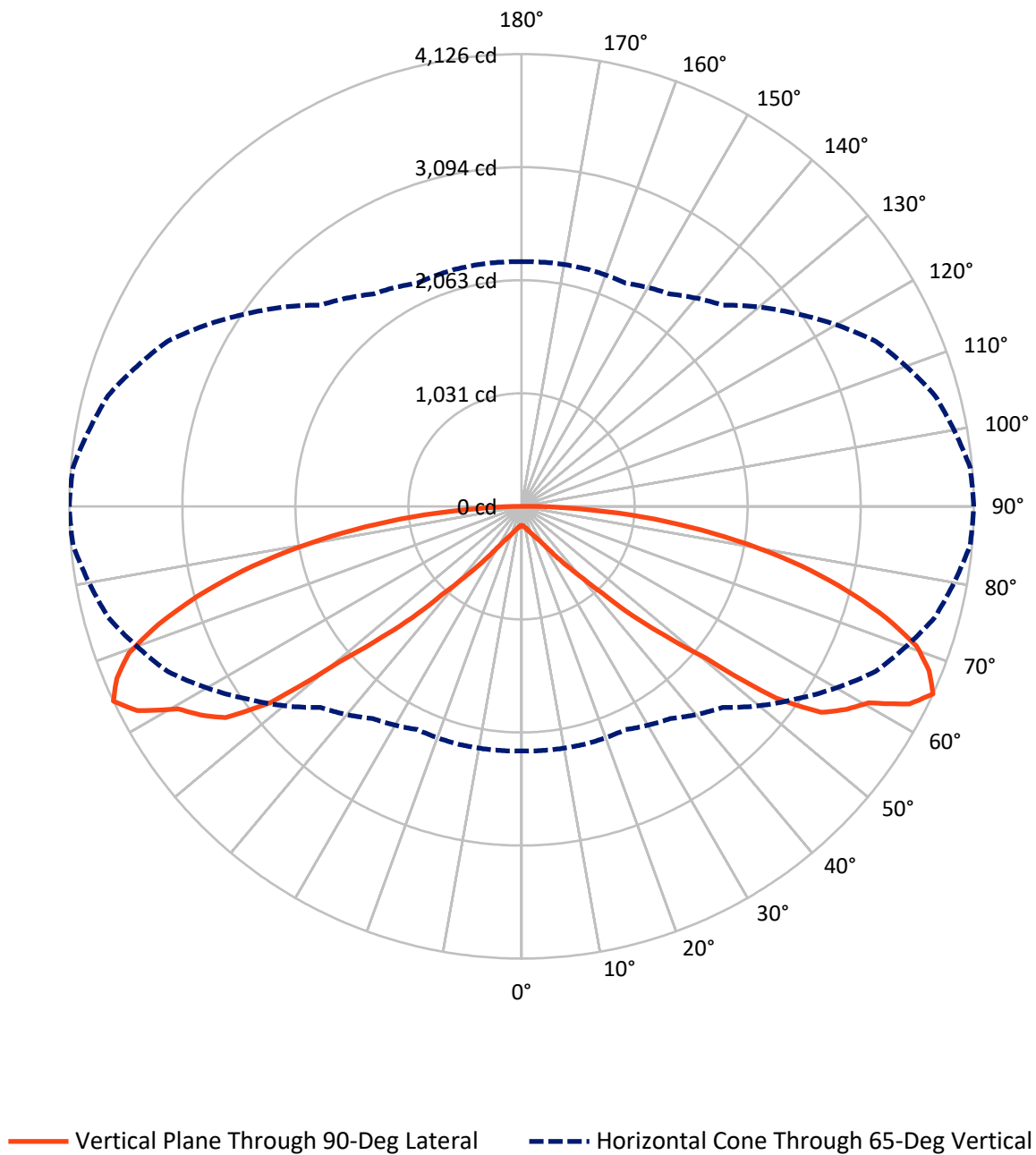
--- 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 1 fc  
 Type IV - Short - N/A

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## Luminous Intensity Polar Plot



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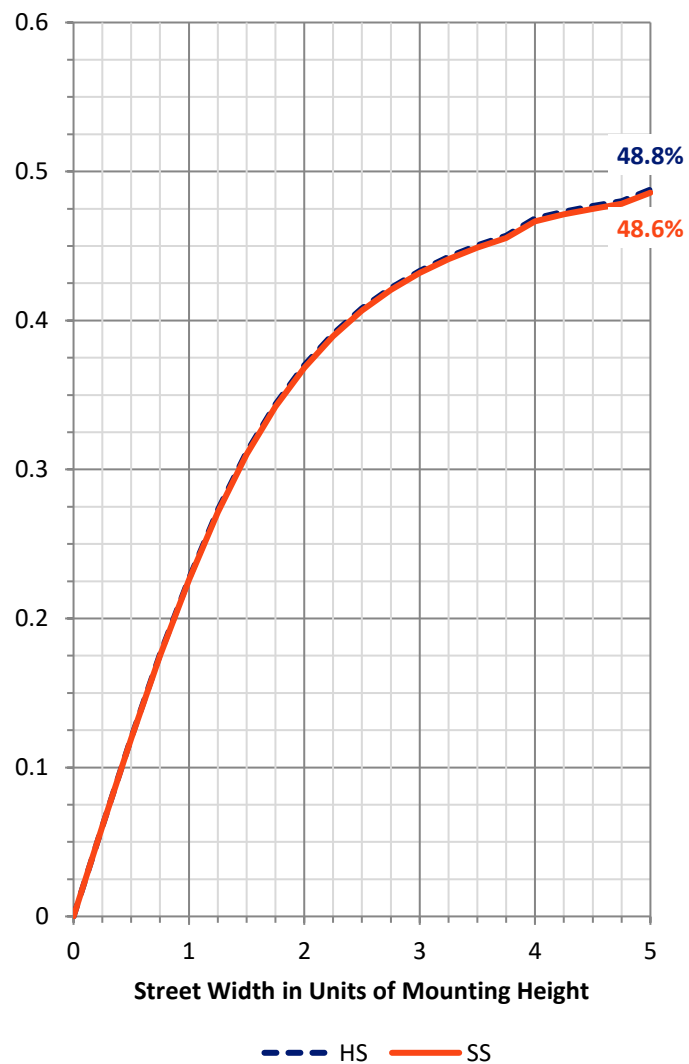
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 4735.5   | 0.0    | 4735.5 |
|                    | % Fixture | 50.0     | 0.0    | 50.0   |
| <b>Street Side</b> | Lumens    | 4735.5   | 0.0    | 4735.5 |
|                    | % Fixture | 50.0     | 0.0    | 50.0   |
| <b>Total</b>       | Lumens    | 9471.0   | 0.0    | 9471.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 18.1   | 0.2       |
| 10°-20°   | 67.5   | 0.7       |
| 20°-30°   | 156.1  | 1.6       |
| 30°-40°   | 352.9  | 3.7       |
| 40°-50°   | 859.6  | 9.1       |
| 50°-60°   | 1933.0 | 20.4      |
| 60°-70°   | 2825.0 | 29.8      |
| 70°-80°   | 2461.6 | 26.0      |
| 80°-90°   | 797.4  | 8.4       |
| 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°    | 9471.0 | 100.0     |
| 0°-180°   | 9471.0 | 100.0     |

**Coefficient of Utilization**



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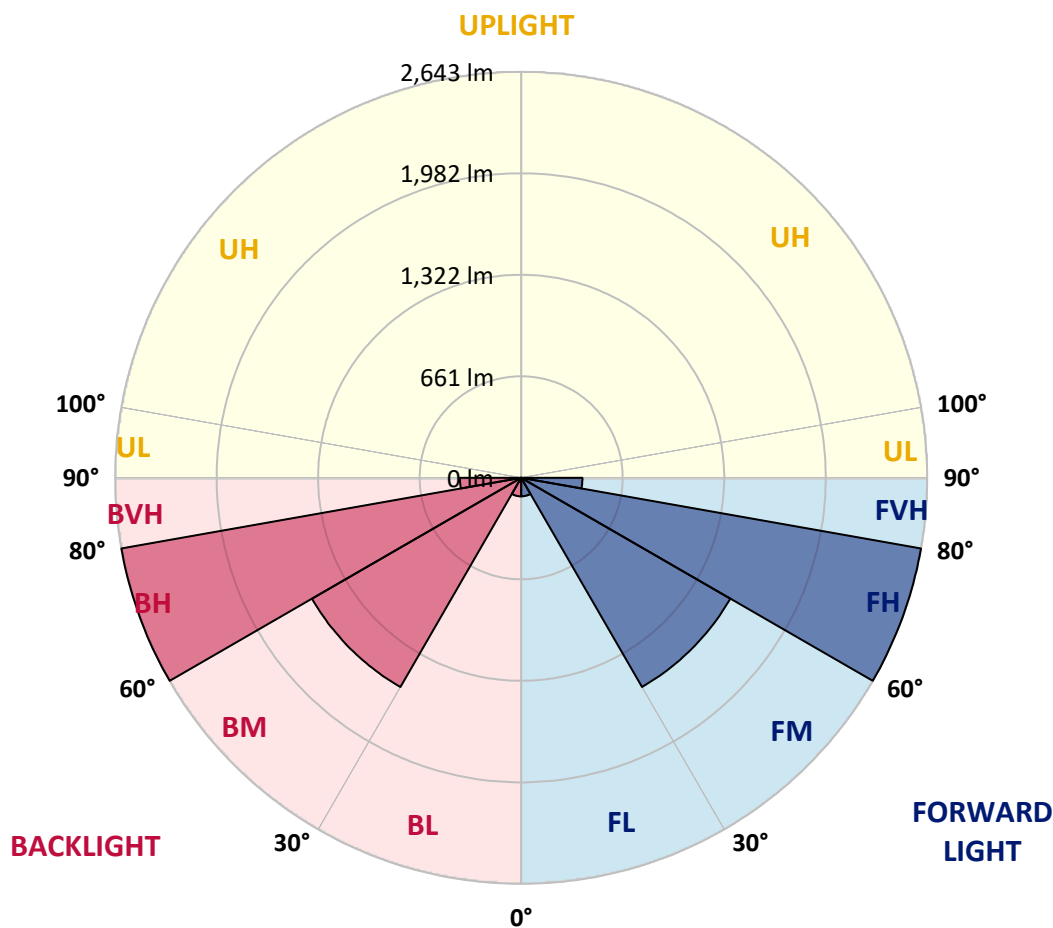
CATALOG NUMBER: TT-D6-735-U-RW-PM

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 120.8  | 1.3       |                         |      |         |
| FM   | (30°-60°)   | 1572.7 | 16.6      |                         |      |         |
| FH   | (60°-80°)   | 2643.3 | 27.9      |                         |      | G2/5000 |
| FVH  | (80°-90°)   | 398.7  | 4.2       |                         |      | G3/500  |
| BL   | (0°-30°)    | 120.8  | 1.3       | B1/500                  |      |         |
| BM   | (30°-60°)   | 1572.7 | 16.6      | B2/2500                 |      |         |
| BH   | (60°-80°)   | 2643.3 | 27.9      | B4/5000                 |      | G4/5000 |
| BVH  | (80°-90°)   | 398.7  | 4.2       |                         |      | G3/500  |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B4-U0-G4**

Type IV Short



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 65°    | 75°    | 85°    | 90°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 173.0  | 173.0  | 173.0  | 173.0  | 173.0  | 173.0  | 173.0  | 173.0  | 173.0  | 173.0  | 173.0  |
| 2.5°  | 175.3  | 175.3  | 177.5  | 177.5  | 177.5  | 177.5  | 177.5  | 177.5  | 177.5  | 177.5  | 177.5  |
| 5°    | 182.0  | 182.0  | 182.0  | 182.0  | 184.3  | 184.3  | 182.0  | 182.0  | 182.0  | 182.0  | 182.0  |
| 7.5°  | 193.3  | 191.0  | 193.3  | 193.3  | 193.3  | 191.0  | 191.0  | 191.0  | 188.8  | 188.8  | 188.8  |
| 10°   | 204.5  | 204.5  | 206.7  | 204.5  | 204.5  | 202.3  | 202.3  | 202.3  | 200.0  | 200.0  | 200.0  |
| 12.5° | 220.2  | 220.2  | 220.2  | 220.2  | 218.0  | 218.0  | 215.7  | 213.5  | 211.2  | 211.2  | 211.2  |
| 15°   | 240.5  | 238.2  | 238.2  | 236.0  | 233.7  | 231.5  | 229.2  | 229.2  | 227.0  | 227.0  | 227.0  |
| 17.5° | 260.7  | 260.7  | 258.4  | 256.2  | 251.7  | 249.4  | 249.4  | 247.2  | 244.9  | 244.9  | 244.9  |
| 20°   | 285.4  | 285.4  | 283.2  | 278.7  | 274.2  | 271.9  | 269.7  | 269.7  | 267.4  | 267.4  | 267.4  |
| 22.5° | 314.6  | 312.4  | 307.9  | 303.4  | 298.9  | 296.6  | 294.4  | 292.1  | 292.1  | 292.1  | 292.1  |
| 25°   | 346.1  | 343.8  | 341.6  | 334.8  | 328.1  | 325.8  | 321.4  | 321.4  | 319.1  | 321.4  | 321.4  |
| 27.5° | 384.3  | 382.0  | 377.5  | 370.8  | 361.8  | 357.3  | 355.1  | 355.1  | 357.3  | 357.3  | 359.6  |
| 30°   | 431.5  | 427.0  | 422.5  | 413.5  | 404.5  | 397.8  | 397.8  | 400.0  | 406.7  | 411.2  | 411.2  |
| 32.5° | 487.6  | 485.4  | 478.7  | 469.7  | 453.9  | 449.4  | 453.9  | 467.4  | 476.4  | 483.2  | 487.6  |
| 35°   | 552.8  | 550.6  | 541.6  | 525.9  | 514.6  | 512.4  | 525.9  | 548.3  | 577.5  | 586.5  | 591.0  |
| 37.5° | 624.7  | 627.0  | 615.7  | 597.8  | 586.5  | 591.0  | 618.0  | 660.7  | 689.9  | 710.1  | 714.6  |
| 40°   | 714.6  | 719.1  | 705.6  | 685.4  | 674.2  | 692.1  | 734.8  | 784.3  | 836.0  | 860.7  | 867.4  |
| 42.5° | 820.2  | 827.0  | 809.0  | 788.8  | 782.0  | 811.2  | 871.9  | 952.8  | 1045.0 | 1074.2 | 1085.4 |
| 45°   | 950.6  | 955.1  | 932.6  | 914.6  | 910.1  | 961.8  | 1065.2 | 1200.0 | 1346.1 | 1413.5 | 1424.7 |
| 47.5° | 1105.6 | 1103.4 | 1083.2 | 1060.7 | 1065.2 | 1139.3 | 1294.4 | 1476.4 | 1631.5 | 1734.9 | 1757.3 |
| 50°   | 1283.2 | 1271.9 | 1256.2 | 1229.2 | 1258.4 | 1366.3 | 1561.8 | 1782.1 | 2042.7 | 2134.9 | 2175.3 |
| 52.5° | 1460.7 | 1440.5 | 1427.0 | 1409.0 | 1460.7 | 1600.0 | 1874.2 | 2258.5 | 2651.7 | 2863.0 | 2905.7 |
| 55°   | 1620.3 | 1604.5 | 1597.8 | 1600.0 | 1680.9 | 1880.9 | 2240.5 | 2732.6 | 3112.4 | 3287.7 | 3319.2 |
| 57.5° | 1777.6 | 1768.6 | 1761.8 | 1775.3 | 1903.4 | 2164.1 | 2568.6 | 3029.3 | 3341.6 | 3472.0 | 3494.4 |
| 60°   | 1925.9 | 1934.9 | 1930.4 | 1970.8 | 2125.9 | 2388.8 | 2739.4 | 3193.3 | 3494.4 | 3613.5 | 3638.3 |
| 62.5° | 2089.9 | 2096.7 | 2096.7 | 2141.6 | 2267.5 | 2498.9 | 2856.2 | 3386.6 | 3768.6 | 3943.9 | 3970.9 |
| 65°   | 2231.5 | 2236.0 | 2245.0 | 2247.2 | 2364.1 | 2595.5 | 3063.0 | 3564.1 | 3905.7 | 4107.9 | 4125.9 |
| 67.5° | 2337.1 | 2341.6 | 2330.4 | 2319.1 | 2409.0 | 2618.0 | 3047.2 | 3541.6 | 3845.0 | 3997.8 | 4011.3 |
| 70°   | 2422.5 | 2402.3 | 2370.8 | 2314.6 | 2343.9 | 2501.2 | 2916.9 | 3361.9 | 3667.5 | 3804.6 | 3824.8 |
| 72.5° | 2433.7 | 2415.8 | 2316.9 | 2191.0 | 2155.1 | 2292.2 | 2687.7 | 3087.7 | 3350.6 | 3481.0 | 3483.2 |
| 75°   | 2366.3 | 2319.1 | 2155.1 | 1966.3 | 1898.9 | 2029.2 | 2368.6 | 2732.6 | 2943.9 | 3054.0 | 3065.2 |
| 77.5° | 2139.4 | 2094.4 | 1887.7 | 1671.9 | 1595.5 | 1707.9 | 1995.5 | 2289.9 | 2492.2 | 2600.0 | 2606.8 |
| 80°   | 1737.1 | 1721.4 | 1532.6 | 1334.9 | 1242.7 | 1307.9 | 1559.6 | 1791.0 | 1955.1 | 2083.2 | 2094.4 |
| 82.5° | 1280.9 | 1267.4 | 1123.6 | 950.6  | 876.4  | 930.4  | 1110.1 | 1280.9 | 1433.7 | 1537.1 | 1543.8 |
| 85°   | 800.0  | 773.0  | 683.2  | 561.8  | 512.4  | 548.3  | 667.4  | 782.0  | 919.1  | 1000.0 | 1004.5 |
| 87.5° | 267.4  | 256.2  | 220.2  | 182.0  | 152.8  | 159.6  | 195.5  | 238.2  | 348.3  | 384.3  | 406.7  |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

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

Report Prepared for

Cooper Lighting Solutions

MCGRAW EDISON

Report Number: SP1-2411-284-1

Test Date: 11/15/2024

Luminaire Tested: TTN-D0-735-U-WQ

Data in this report applies to families of products including TT-D\* and TTN-D\*

### Test Information

Test Method: LM-79-2019  
 Report Number: SP1-2411-284-1  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry:  $4\pi$   
 Issue Date: 11/15/2024  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: MCGRAW EDISON  
 Catalog Number: **TTN-D0-735-U-WQ**  
 Description: TOPTIER NANO LED PARKING GARAGE LUMINAIRE. 3500K, 70 CRI LEDS AND WIDE DISTRIBUTION

### Spectral Parameters

|                           |          |           |      |      |       |
|---------------------------|----------|-----------|------|------|-------|
| CCT (K):                  | 3405     | CRI (Ra): | 73.9 |      |       |
| CIE u':                   | 0.2365   | R1:       | 71.3 | R9:  | -18.0 |
| CIE v':                   | 0.5180   | R2:       | 80.3 | R10: | 53.1  |
| Duv:                      | 0.0036   | R3:       | 87.8 | R11: | 68.6  |
| CIE x:                    | 0.4148   | R4:       | 73.2 | R12: | 42.6  |
| CIE y:                    | 0.4038   | R5:       | 69.8 | R13: | 72.5  |
| CIE z:                    | 0.1814   | R6:       | 71.8 | R14: | 92.7  |
| Peak Wavelength (nm):     | 596      | R7:       | 82.8 | R15: | 64.3  |
| Dominant Wavelength (nm): | 579      | R8:       | 54.1 |      |       |
| Purity:                   | 45.70672 |           |      |      |       |
| Rf:                       | 76.6     |           |      |      |       |
| Rg:                       | 95.4     |           |      |      |       |



### Test Conditions

Stabilization Time: 38M  
 Operation Time: 1H 38M  
 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 3500K 4-step quadrangle

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### Photopic Flux vs. Wavelength



### Photopic Lumens: NR

| $\lambda$<br>(nm) | Power<br>$\text{W}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) |
|-------------------|-------------------------------|--------------------------------|-------------------|-------------------------------|--------------------------------|-------------------|-------------------------------|--------------------------------|-------------------|-------------------------------|--------------------------------|-------------------|-------------------------------|--------------------------------|
| 360               | 0                             | NR                             | 490               | 119                           | NR                             | 620               | 846                           | NR                             | 750               | 28                            | NR                             | 880               | 1                             | NR                             |
| 365               | 0                             | NR                             | 495               | 160                           | NR                             | 625               | 793                           | NR                             | 755               | 25                            | NR                             | 885               | 0                             | NR                             |
| 370               | 0                             | NR                             | 500               | 225                           | NR                             | 630               | 739                           | NR                             | 760               | 22                            | NR                             | 890               | 0                             | NR                             |
| 375               | 0                             | NR                             | 505               | 308                           | NR                             | 635               | 681                           | NR                             | 765               | 19                            | NR                             | 895               | 0                             | NR                             |
| 380               | 0                             | NR                             | 510               | 392                           | NR                             | 640               | 623                           | NR                             | 770               | 16                            | NR                             | 900               | 0                             | NR                             |
| 385               | 0                             | NR                             | 515               | 474                           | NR                             | 645               | 563                           | NR                             | 775               | 14                            | NR                             | 905               | 0                             | NR                             |
| 390               | 0                             | NR                             | 520               | 545                           | NR                             | 650               | 506                           | NR                             | 780               | 12                            | NR                             | 910               | 0                             | NR                             |
| 395               | 1                             | NR                             | 525               | 603                           | NR                             | 655               | 451                           | NR                             | 785               | 10                            | NR                             | 915               | 0                             | NR                             |
| 400               | 3                             | NR                             | 530               | 649                           | NR                             | 660               | 399                           | NR                             | 790               | 9                             | NR                             | 920               | 0                             | NR                             |
| 405               | 5                             | NR                             | 535               | 687                           | NR                             | 665               | 352                           | NR                             | 795               | 8                             | NR                             | 925               | 0                             | NR                             |
| 410               | 11                            | NR                             | 540               | 721                           | NR                             | 670               | 307                           | NR                             | 800               | 6                             | NR                             | 930               | 0                             | NR                             |
| 415               | 21                            | NR                             | 545               | 751                           | NR                             | 675               | 268                           | NR                             | 805               | 6                             | NR                             | 935               | 0                             | NR                             |
| 420               | 43                            | NR                             | 550               | 779                           | NR                             | 680               | 234                           | NR                             | 810               | 5                             | NR                             | 940               | 0                             | NR                             |
| 425               | 88                            | NR                             | 555               | 811                           | NR                             | 685               | 203                           | NR                             | 815               | 4                             | NR                             | 945               | 0                             | NR                             |
| 430               | 163                           | NR                             | 560               | 843                           | NR                             | 690               | 176                           | NR                             | 820               | 4                             | NR                             | 950               | 0                             | NR                             |
| 435               | 288                           | NR                             | 565               | 873                           | NR                             | 695               | 152                           | NR                             | 825               | 3                             | NR                             | 955               | 0                             | NR                             |
| 440               | 416                           | NR                             | 570               | 907                           | NR                             | 700               | 131                           | NR                             | 830               | 3                             | NR                             | 960               | 0                             | NR                             |
| 445               | 566                           | NR                             | 575               | 938                           | NR                             | 705               | 112                           | NR                             | 835               | 3                             | NR                             | 965               | 0                             | NR                             |
| 450               | 810                           | NR                             | 580               | 965                           | NR                             | 710               | 96                            | NR                             | 840               | 2                             | NR                             | 970               | 0                             | NR                             |
| 455               | 669                           | NR                             | 585               | 986                           | NR                             | 715               | 81                            | NR                             | 845               | 2                             | NR                             | 975               | 0                             | NR                             |
| 460               | 338                           | NR                             | 590               | 997                           | NR                             | 720               | 69                            | NR                             | 850               | 2                             | NR                             | 980               | 0                             | NR                             |
| 465               | 246                           | NR                             | 595               | 997                           | NR                             | 725               | 58                            | NR                             | 855               | 1                             | NR                             | 985               | 0                             | NR                             |
| 470               | 182                           | NR                             | 600               | 991                           | NR                             | 730               | 49                            | NR                             | 860               | 1                             | NR                             | 990               | 0                             | NR                             |
| 475               | 115                           | NR                             | 605               | 968                           | NR                             | 735               | 42                            | NR                             | 865               | 1                             | NR                             | 995               | 0                             | NR                             |
| 480               | 97                            | NR                             | 610               | 939                           | NR                             | 740               | 37                            | NR                             | 870               | 1                             | NR                             | 1000              | 0                             | NR                             |
| 485               | 103                           | NR                             | 615               | 896                           | NR                             | 745               | 32                            | NR                             | 875               | 1                             | NR                             |                   |                               |                                |

REPORT NUMBER: SP1-2411-284-1

### Scotopic Flux vs. Wavelength



Scotopic Lumens: NR

S/P: 1.33

| $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) |
|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|
| 360               | 0                                    | NR                             | 490               | 119                                  | NR                             | 620               | 846                                  | NR                             | 750               | 28                                   | NR                             | 880               | 1                                    | NR                             |
| 365               | 0                                    | NR                             | 495               | 160                                  | NR                             | 625               | 793                                  | NR                             | 755               | 25                                   | NR                             | 885               | 0                                    | NR                             |
| 370               | 0                                    | NR                             | 500               | 225                                  | NR                             | 630               | 739                                  | NR                             | 760               | 22                                   | NR                             | 890               | 0                                    | NR                             |
| 375               | 0                                    | NR                             | 505               | 308                                  | NR                             | 635               | 681                                  | NR                             | 765               | 19                                   | NR                             | 895               | 0                                    | NR                             |
| 380               | 0                                    | NR                             | 510               | 392                                  | NR                             | 640               | 623                                  | NR                             | 770               | 16                                   | NR                             | 900               | 0                                    | NR                             |
| 385               | 0                                    | NR                             | 515               | 474                                  | NR                             | 645               | 563                                  | NR                             | 775               | 14                                   | NR                             | 905               | 0                                    | NR                             |
| 390               | 0                                    | NR                             | 520               | 545                                  | NR                             | 650               | 506                                  | NR                             | 780               | 12                                   | NR                             | 910               | 0                                    | NR                             |
| 395               | 1                                    | NR                             | 525               | 603                                  | NR                             | 655               | 451                                  | NR                             | 785               | 10                                   | NR                             | 915               | 0                                    | NR                             |
| 400               | 3                                    | NR                             | 530               | 649                                  | NR                             | 660               | 399                                  | NR                             | 790               | 9                                    | NR                             | 920               | 0                                    | NR                             |
| 405               | 5                                    | NR                             | 535               | 687                                  | NR                             | 665               | 352                                  | NR                             | 795               | 8                                    | NR                             | 925               | 0                                    | NR                             |
| 410               | 11                                   | NR                             | 540               | 721                                  | NR                             | 670               | 307                                  | NR                             | 800               | 6                                    | NR                             | 930               | 0                                    | NR                             |
| 415               | 21                                   | NR                             | 545               | 751                                  | NR                             | 675               | 268                                  | NR                             | 805               | 6                                    | NR                             | 935               | 0                                    | NR                             |
| 420               | 43                                   | NR                             | 550               | 779                                  | NR                             | 680               | 234                                  | NR                             | 810               | 5                                    | NR                             | 940               | 0                                    | NR                             |
| 425               | 88                                   | NR                             | 555               | 811                                  | NR                             | 685               | 203                                  | NR                             | 815               | 4                                    | NR                             | 945               | 0                                    | NR                             |
| 430               | 163                                  | NR                             | 560               | 843                                  | NR                             | 690               | 176                                  | NR                             | 820               | 4                                    | NR                             | 950               | 0                                    | NR                             |
| 435               | 288                                  | NR                             | 565               | 873                                  | NR                             | 695               | 152                                  | NR                             | 825               | 3                                    | NR                             | 955               | 0                                    | NR                             |
| 440               | 416                                  | NR                             | 570               | 907                                  | NR                             | 700               | 131                                  | NR                             | 830               | 3                                    | NR                             | 960               | 0                                    | NR                             |
| 445               | 566                                  | NR                             | 575               | 938                                  | NR                             | 705               | 112                                  | NR                             | 835               | 3                                    | NR                             | 965               | 0                                    | NR                             |
| 450               | 810                                  | NR                             | 580               | 965                                  | NR                             | 710               | 96                                   | NR                             | 840               | 2                                    | NR                             | 970               | 0                                    | NR                             |
| 455               | 669                                  | NR                             | 585               | 986                                  | NR                             | 715               | 81                                   | NR                             | 845               | 2                                    | NR                             | 975               | 0                                    | NR                             |
| 460               | 338                                  | NR                             | 590               | 997                                  | NR                             | 720               | 69                                   | NR                             | 850               | 2                                    | NR                             | 980               | 0                                    | NR                             |
| 465               | 246                                  | NR                             | 595               | 997                                  | NR                             | 725               | 58                                   | NR                             | 855               | 1                                    | NR                             | 985               | 0                                    | NR                             |
| 470               | 182                                  | NR                             | 600               | 991                                  | NR                             | 730               | 49                                   | NR                             | 860               | 1                                    | NR                             | 990               | 0                                    | NR                             |
| 475               | 115                                  | NR                             | 605               | 968                                  | NR                             | 735               | 42                                   | NR                             | 865               | 1                                    | NR                             | 995               | 0                                    | NR                             |
| 480               | 97                                   | NR                             | 610               | 939                                  | NR                             | 740               | 37                                   | NR                             | 870               | 1                                    | NR                             | 1000              | 0                                    | NR                             |
| 485               | 103                                  | NR                             | 615               | 896                                  | NR                             | 745               | 32                                   | NR                             | 875               | 1                                    | NR                             |                   |                                      |                                |

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### Melanopic Flux vs. Wavelength



Melanopic Lumens: NR

M/P: 2.47

| λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) |
|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|
| 360       | 0                           | NR               | 490       | 119                         | NR               | 620       | 846                         | NR               | 750       | 28                          | NR               | 880       | 1                           | NR               |
| 365       | 0                           | NR               | 495       | 160                         | NR               | 625       | 793                         | NR               | 755       | 25                          | NR               | 885       | 0                           | NR               |
| 370       | 0                           | NR               | 500       | 225                         | NR               | 630       | 739                         | NR               | 760       | 22                          | NR               | 890       | 0                           | NR               |
| 375       | 0                           | NR               | 505       | 308                         | NR               | 635       | 681                         | NR               | 765       | 19                          | NR               | 895       | 0                           | NR               |
| 380       | 0                           | NR               | 510       | 392                         | NR               | 640       | 623                         | NR               | 770       | 16                          | NR               | 900       | 0                           | NR               |
| 385       | 0                           | NR               | 515       | 474                         | NR               | 645       | 563                         | NR               | 775       | 14                          | NR               | 905       | 0                           | NR               |
| 390       | 0                           | NR               | 520       | 545                         | NR               | 650       | 506                         | NR               | 780       | 12                          | NR               | 910       | 0                           | NR               |
| 395       | 1                           | NR               | 525       | 603                         | NR               | 655       | 451                         | NR               | 785       | 10                          | NR               | 915       | 0                           | NR               |
| 400       | 3                           | NR               | 530       | 649                         | NR               | 660       | 399                         | NR               | 790       | 9                           | NR               | 920       | 0                           | NR               |
| 405       | 5                           | NR               | 535       | 687                         | NR               | 665       | 352                         | NR               | 795       | 8                           | NR               | 925       | 0                           | NR               |
| 410       | 11                          | NR               | 540       | 721                         | NR               | 670       | 307                         | NR               | 800       | 6                           | NR               | 930       | 0                           | NR               |
| 415       | 21                          | NR               | 545       | 751                         | NR               | 675       | 268                         | NR               | 805       | 6                           | NR               | 935       | 0                           | NR               |
| 420       | 43                          | NR               | 550       | 779                         | NR               | 680       | 234                         | NR               | 810       | 5                           | NR               | 940       | 0                           | NR               |
| 425       | 88                          | NR               | 555       | 811                         | NR               | 685       | 203                         | NR               | 815       | 4                           | NR               | 945       | 0                           | NR               |
| 430       | 163                         | NR               | 560       | 843                         | NR               | 690       | 176                         | NR               | 820       | 4                           | NR               | 950       | 0                           | NR               |
| 435       | 288                         | NR               | 565       | 873                         | NR               | 695       | 152                         | NR               | 825       | 3                           | NR               | 955       | 0                           | NR               |
| 440       | 416                         | NR               | 570       | 907                         | NR               | 700       | 131                         | NR               | 830       | 3                           | NR               | 960       | 0                           | NR               |
| 445       | 566                         | NR               | 575       | 938                         | NR               | 705       | 112                         | NR               | 835       | 3                           | NR               | 965       | 0                           | NR               |
| 450       | 810                         | NR               | 580       | 965                         | NR               | 710       | 96                          | NR               | 840       | 2                           | NR               | 970       | 0                           | NR               |
| 455       | 669                         | NR               | 585       | 986                         | NR               | 715       | 81                          | NR               | 845       | 2                           | NR               | 975       | 0                           | NR               |
| 460       | 338                         | NR               | 590       | 997                         | NR               | 720       | 69                          | NR               | 850       | 2                           | NR               | 980       | 0                           | NR               |
| 465       | 246                         | NR               | 595       | 997                         | NR               | 725       | 58                          | NR               | 855       | 1                           | NR               | 985       | 0                           | NR               |
| 470       | 182                         | NR               | 600       | 991                         | NR               | 730       | 49                          | NR               | 860       | 1                           | NR               | 990       | 0                           | NR               |
| 475       | 115                         | NR               | 605       | 968                         | NR               | 735       | 42                          | NR               | 865       | 1                           | NR               | 995       | 0                           | NR               |
| 480       | 97                          | NR               | 610       | 939                         | NR               | 740       | 37                          | NR               | 870       | 1                           | NR               | 1000      | 0                           | NR               |
| 485       | 103                         | NR               | 615       | 896                         | NR               | 745       | 32                          | NR               | 875       | 1                           | NR               |           |                             |                  |

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TM-30-18

### Summary

$R_f = 76.6$   
 $R_g = 95.4$   
 $CIE R_a = 73.9$   
 $R_g = -18.0$

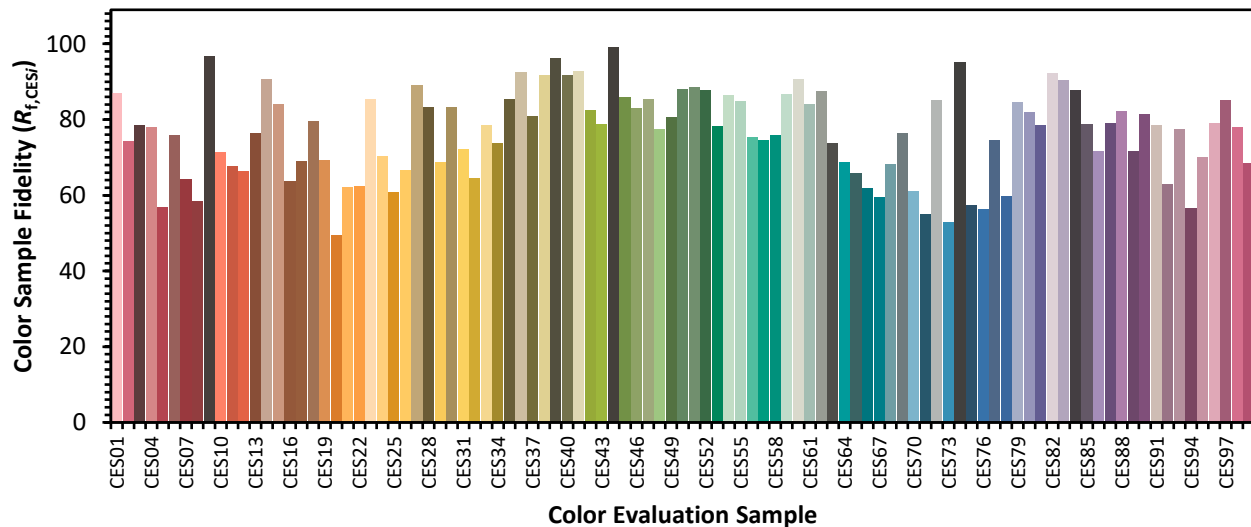


### Color Vector Graphics

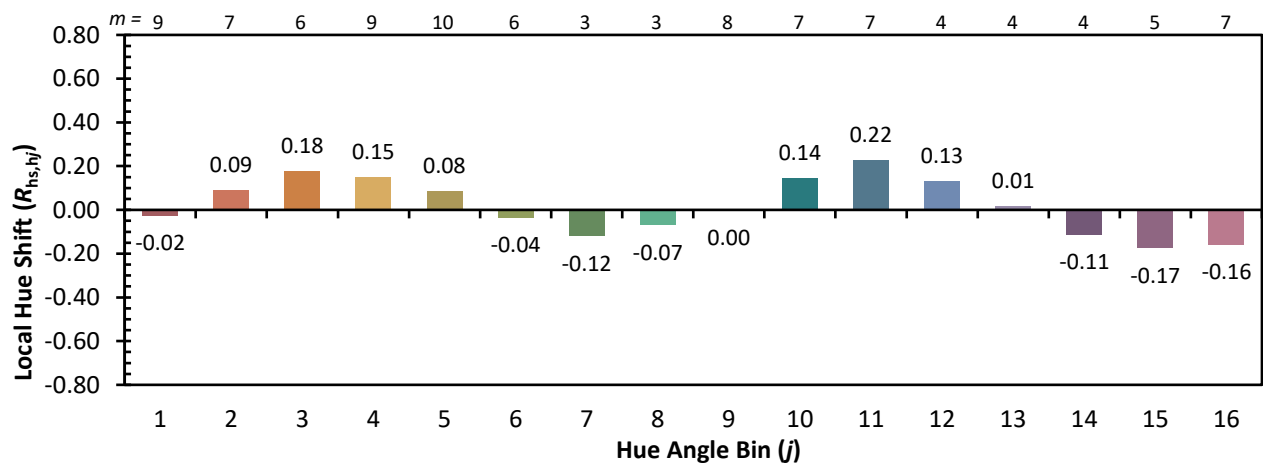


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

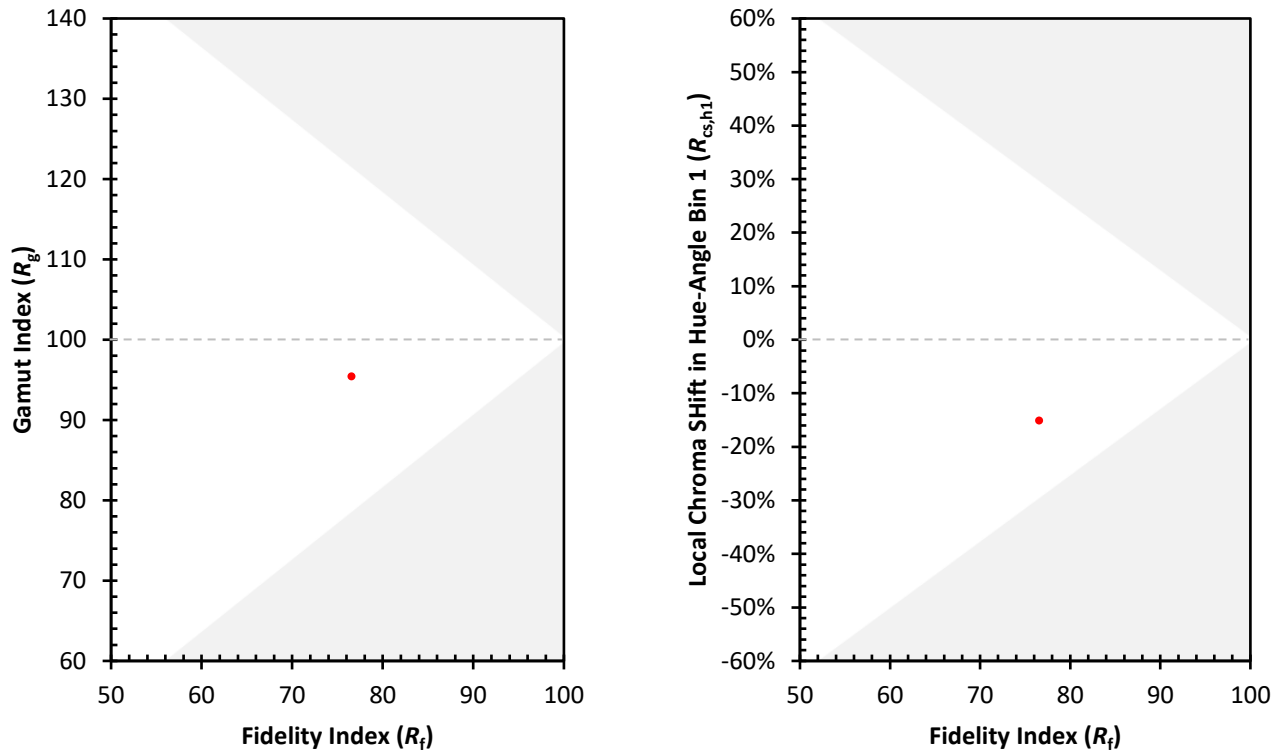
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 67 | CES51 = 88 | CES76 = 56 |
| CES02 = 62 | CES27 = 89 | CES52 = 88 | CES77 = 75 |
| CES03 = 31 | CES28 = 83 | CES53 = 78 | CES78 = 60 |
| CES04 = 70 | CES29 = 69 | CES54 = 86 | CES79 = 85 |
| CES05 = 48 | CES30 = 83 | CES55 = 85 | CES80 = 82 |
| CES06 = 51 | CES31 = 72 | CES56 = 75 | CES81 = 78 |
| CES07 = 41 | CES32 = 65 | CES57 = 75 | CES82 = 92 |
| CES08 = 40 | CES33 = 78 | CES58 = 76 | CES83 = 90 |
| CES09 = 29 | CES34 = 74 | CES59 = 87 | CES84 = 88 |
| CES10 = 75 | CES35 = 86 | CES60 = 91 | CES85 = 79 |
| CES11 = 58 | CES36 = 93 | CES61 = 84 | CES86 = 72 |
| CES12 = 64 | CES37 = 81 | CES62 = 88 | CES87 = 79 |
| CES13 = 43 | CES38 = 92 | CES63 = 74 | CES88 = 82 |
| CES14 = 74 | CES39 = 96 | CES64 = 69 | CES89 = 72 |
| CES15 = 71 | CES40 = 92 | CES65 = 66 | CES90 = 82 |
| CES16 = 47 | CES41 = 93 | CES66 = 62 | CES91 = 79 |
| CES17 = 50 | CES42 = 83 | CES67 = 60 | CES92 = 63 |
| CES18 = 56 | CES43 = 79 | CES68 = 68 | CES93 = 77 |
| CES19 = 72 | CES44 = 99 | CES69 = 76 | CES94 = 56 |
| CES20 = 65 | CES45 = 86 | CES70 = 61 | CES95 = 70 |
| CES21 = 86 | CES46 = 83 | CES71 = 55 | CES96 = 79 |
| CES22 = 79 | CES47 = 85 | CES72 = 85 | CES97 = 85 |
| CES23 = 92 | CES48 = 78 | CES73 = 53 | CES98 = 78 |
| CES24 = 91 | CES49 = 81 | CES74 = 95 | CES99 = 68 |
| CES25 = 72 | CES50 = 88 | CES75 = 57 |            |



### Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)