

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



Scaled data based on original data using  
LM-79-2019 Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Test Report Prepared for

Cooper Lighting Solutions

Brand: McGRAW-EDISON

Report Number: P635819

Luminaire Tested: GWS-SA3E-750-U-5WQ-W-GRSBK

Issue Date: 1/10/2023

**Test Information**

Test Method: LM-79-2019  
Report Number: P635819  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2209-782-2)  
Test Lab: COOPER LIGHTING SOLUTIONS  
Issue Date: 1/10/2023  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: McGRAW-EDISON  
Catalog Number: GWS-SA3E-750-U-5WQ-W-GRSBK  
Description: GALLEON WALL SLIM LUMINAIRE. (3) LIGHTSQUARES WITH 16 LEDS EACH AND TYPE V WIDE OPTICS W/ FACTORY INSTALLED GLARE SHIELD, BK  
Light Source: (48) 5000K CCT, 70 CRI LEDS  
Ballast/Driver: -

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 11838.4 lumens  
Efficiency: N/A  
Efficacy: 74.4 lumens/watt  
Luminous Opening: Rectangular (W 1.5' x L: 0.5' x H: 0')  
IES Classification: Type V - Short  
BUG Rating: B3 - U0 - G1  
  
Input Watts (W): 159.2  
Input Voltage (V): 120  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 0  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 28.75 FT

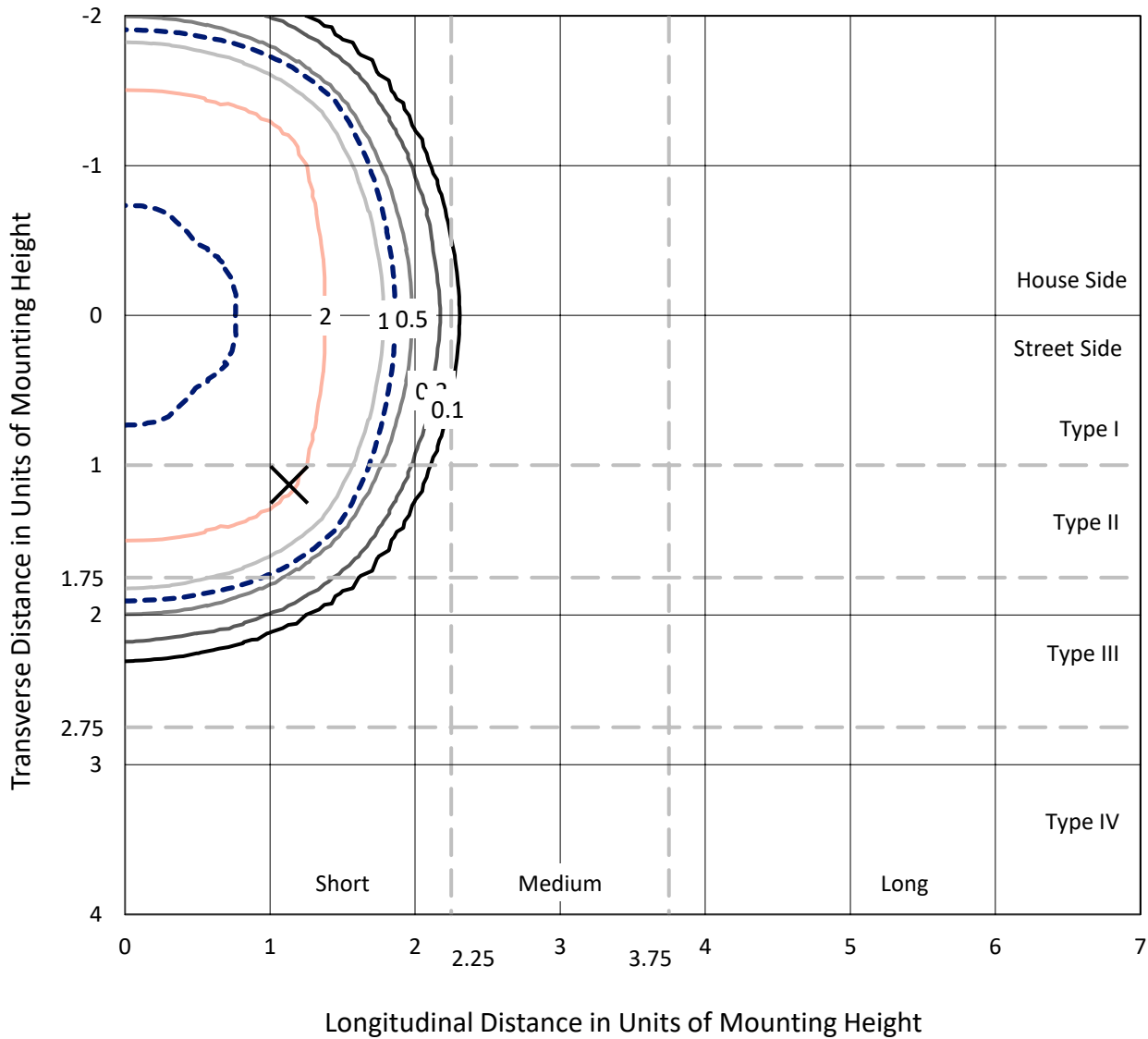


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### Iso-Footcandle Lines of Horizontal Illumination

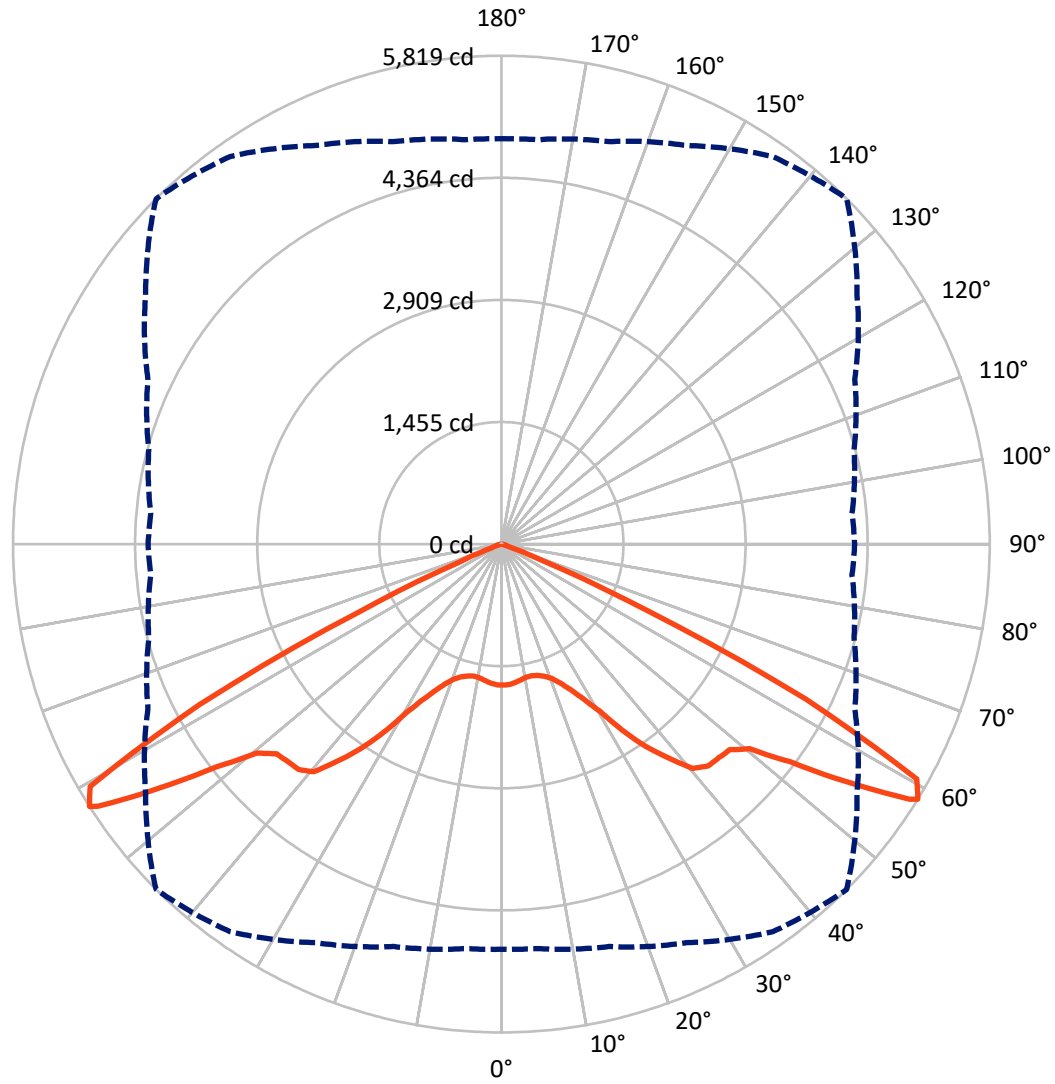
✕ Max cd  
 - - - 1/2 Max cd



Based on 20 foot mounting height. Maximum calculated value = 4.2 fc  
 Type V - Short - N/A

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### Luminous Intensity Polar Plot



— Vertical Plane Through 45-Deg Lateral    - - - Horizontal Cone Through 58-Deg Vertical

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**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 5919.2   | 0.0    | 5919.2  |
|                    | % Fixture | 50.0     | 0.0    | 50.0    |
| <b>Street Side</b> | Lumens    | 5919.2   | 0.0    | 5919.2  |
|                    | % Fixture | 50.0     | 0.0    | 50.0    |
| <b>Total</b>       | Lumens    | 11838.4  | 0.0    | 11838.4 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 156.6   | 1.3       |
| 10°-20°   | 463.5   | 3.9       |
| 20°-30°   | 876.6   | 7.4       |
| 30°-40°   | 1728.8  | 14.6      |
| 40°-50°   | 2735.8  | 23.1      |
| 50°-60°   | 4021.5  | 34.0      |
| 60°-70°   | 1795.0  | 15.2      |
| 70°-80°   | 60.1    | 0.5       |
| 80°-90°   | 0.5     | 0.0       |
| 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°    | 11838.4 | 100.0     |
| 0°-180°   | 11838.4 | 100.0     |

**Coefficient of Utilization**



REPORT NUMBER: P635819

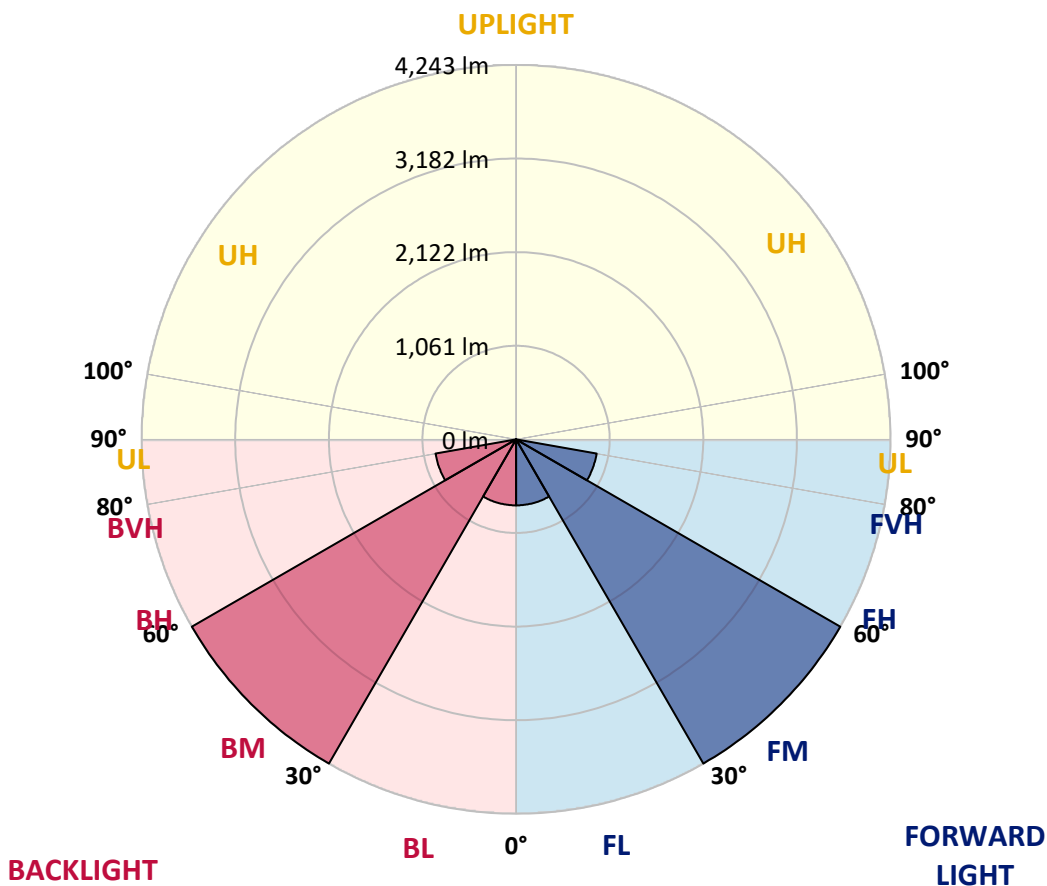
CATALOG NUMBER: GWS-SA3E-750-U-5WQ-W-GRSBK

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

| Zone           | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|----------------|--------|-----------|-------------------------|------|---------|
|                |        |           | B                       | U    | G       |
| FL (0°-30°)    | 748.3  | 6.3       |                         |      |         |
| FM (30°-60°)   | 4243.0 | 35.8      |                         |      |         |
| FH (60°-80°)   | 927.6  | 7.8       |                         |      | G1/1800 |
| FVH (80°-90°)  | 0.2    | 0.0       |                         |      | G0/10   |
| BL (0°-30°)    | 748.3  | 6.3       | B2/1000                 |      |         |
| BM (30°-60°)   | 4243.0 | 35.8      | B3/5000                 |      |         |
| BH (60°-80°)   | 927.6  | 7.8       | B2/1000                 |      | G1/1800 |
| BVH (80°-90°)  | 0.2    | 0.0       |                         |      | G0/10   |
| 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





REPORT NUMBER: P635819

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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 65°    | 75°    | 85°    | 90°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1678.8 | 1678.8 | 1678.8 | 1678.8 | 1678.8 | 1678.8 | 1678.8 | 1678.8 | 1678.8 | 1678.8 | 1678.8 |
| 2.5°  | 1662.7 | 1665.9 | 1669.2 | 1670.8 | 1672.4 | 1677.2 | 1678.8 | 1674.0 | 1674.0 | 1664.3 | 1675.6 |
| 5°    | 1654.7 | 1657.9 | 1661.1 | 1659.5 | 1659.5 | 1659.5 | 1657.9 | 1651.4 | 1649.8 | 1640.1 | 1651.4 |
| 7.5°  | 1640.1 | 1643.4 | 1643.4 | 1638.5 | 1635.3 | 1635.3 | 1633.7 | 1625.6 | 1624.0 | 1614.3 | 1625.6 |
| 10°   | 1628.8 | 1630.5 | 1628.8 | 1619.2 | 1612.7 | 1612.7 | 1611.1 | 1607.9 | 1609.5 | 1603.0 | 1612.7 |
| 12.5° | 1635.3 | 1636.9 | 1630.5 | 1617.6 | 1609.5 | 1607.9 | 1603.0 | 1598.2 | 1603.0 | 1601.4 | 1611.1 |
| 15°   | 1656.3 | 1657.9 | 1646.6 | 1630.5 | 1624.0 | 1624.0 | 1611.1 | 1598.2 | 1604.7 | 1606.3 | 1617.6 |
| 17.5° | 1682.1 | 1682.1 | 1667.6 | 1653.0 | 1654.7 | 1654.7 | 1633.7 | 1611.1 | 1612.7 | 1619.2 | 1630.5 |
| 20°   | 1712.7 | 1712.7 | 1698.2 | 1695.0 | 1706.3 | 1707.9 | 1682.1 | 1646.6 | 1638.5 | 1643.4 | 1656.3 |
| 22.5° | 1767.5 | 1767.5 | 1756.3 | 1764.3 | 1790.1 | 1798.2 | 1759.5 | 1709.5 | 1690.1 | 1693.4 | 1706.3 |
| 25°   | 1853.0 | 1853.0 | 1849.8 | 1869.1 | 1906.2 | 1924.0 | 1872.4 | 1806.2 | 1774.0 | 1769.2 | 1783.7 |
| 27.5° | 1996.5 | 1998.2 | 1993.3 | 2022.4 | 2069.1 | 2090.1 | 2019.1 | 1932.0 | 1893.3 | 1885.3 | 1899.8 |
| 30°   | 2182.0 | 2182.0 | 2183.6 | 2223.9 | 2285.2 | 2312.6 | 2219.1 | 2117.5 | 2072.3 | 2046.5 | 2065.9 |
| 32.5° | 2388.4 | 2391.7 | 2407.8 | 2475.5 | 2583.6 | 2640.0 | 2502.9 | 2361.0 | 2288.5 | 2261.0 | 2282.0 |
| 35°   | 2728.7 | 2698.1 | 2678.7 | 2728.7 | 2885.2 | 2959.3 | 2783.6 | 2617.4 | 2562.6 | 2559.4 | 2612.6 |
| 37.5° | 3065.8 | 3048.0 | 3007.7 | 3059.3 | 3199.6 | 3233.5 | 3040.0 | 2901.3 | 2862.6 | 2883.5 | 2936.8 |
| 40°   | 3333.5 | 3301.2 | 3248.0 | 3296.4 | 3480.3 | 3514.1 | 3275.4 | 3138.4 | 3123.8 | 3170.6 | 3243.2 |
| 42.5° | 3544.8 | 3499.6 | 3428.6 | 3439.9 | 3588.3 | 3612.5 | 3401.2 | 3298.0 | 3307.7 | 3365.7 | 3448.0 |
| 45°   | 3639.9 | 3604.4 | 3541.5 | 3536.7 | 3630.2 | 3631.8 | 3465.7 | 3412.5 | 3438.3 | 3483.5 | 3548.0 |
| 47.5° | 3680.2 | 3664.1 | 3628.6 | 3620.6 | 3673.8 | 3660.9 | 3557.7 | 3535.1 | 3559.3 | 3572.2 | 3609.3 |
| 50°   | 3780.2 | 3780.2 | 3785.1 | 3791.5 | 3846.3 | 3833.4 | 3760.9 | 3735.1 | 3704.4 | 3659.3 | 3670.6 |
| 52.5° | 4060.8 | 4072.1 | 4118.9 | 4170.5 | 4270.5 | 4312.4 | 4194.7 | 4044.7 | 3897.9 | 3799.6 | 3799.6 |
| 55°   | 4567.2 | 4578.5 | 4633.3 | 4720.4 | 4904.3 | 5004.3 | 4730.1 | 4399.5 | 4197.9 | 4064.1 | 4081.8 |
| 57.5° | 4846.2 | 4859.1 | 4972.0 | 5207.5 | 5563.9 | 5733.2 | 5144.6 | 4654.3 | 4372.1 | 4218.9 | 4231.8 |
| 58°   | 4828.5 | 4836.6 | 4964.0 | 5239.7 | 5636.5 | 5818.7 | 5173.6 | 4646.2 | 4349.5 | 4193.1 | 4209.2 |
| 60°   | 4289.8 | 4278.5 | 4481.8 | 4875.3 | 5434.9 | 5686.5 | 4884.9 | 4241.5 | 3896.3 | 3736.7 | 3744.7 |
| 62.5° | 2804.5 | 2811.0 | 2986.8 | 3398.0 | 3833.4 | 4070.5 | 3412.5 | 2933.5 | 2656.2 | 2559.4 | 2535.2 |
| 65°   | 1170.8 | 1149.9 | 1257.9 | 1486.9 | 1748.2 | 1880.4 | 1615.9 | 1367.6 | 1196.6 | 1132.1 | 1149.9 |
| 67.5° | 301.6  | 293.5  | 300.0  | 375.8  | 459.6  | 543.5  | 456.4  | 348.3  | 303.2  | 306.4  | 306.4  |
| 70°   | 170.9  | 161.3  | 130.6  | 121.0  | 117.7  | 117.7  | 117.7  | 117.7  | 135.5  | 159.7  | 164.5  |
| 72.5° | 129.0  | 121.0  | 95.2   | 82.2   | 72.6   | 67.7   | 71.0   | 82.2   | 98.4   | 119.3  | 122.6  |
| 75°   | 64.5   | 64.5   | 58.1   | 54.8   | 48.4   | 45.2   | 46.8   | 51.6   | 59.7   | 67.7   | 66.1   |
| 77.5° | 12.9   | 14.5   | 16.1   | 19.4   | 16.1   | 16.1   | 16.1   | 19.4   | 19.4   | 21.0   | 19.4   |
| 80°   | 1.6    | 1.6    | 1.6    | 1.6    | 1.6    | 1.6    | 1.6    | 1.6    | 1.6    | 1.6    | 1.6    |
| 82.5° | 0.0    | 1.6    | 1.6    | 0.0    | 0.0    | 0.0    | 0.0    | 1.6    | 1.6    | 1.6    | 1.6    |
| 85°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 1.6    | 1.6    |
| 87.5° | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

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



LM-79-2008: Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Report Prepared for

Cooper Lighting Solutions

McGRAW-EDISON

Report Number: SP1-1908-441-4-R4

Test Date: 10/02/2019

Luminaire Tested: SA1C-750-U-5WQ

Data in this report applies to families of products SA1C-760-U-5WQ .



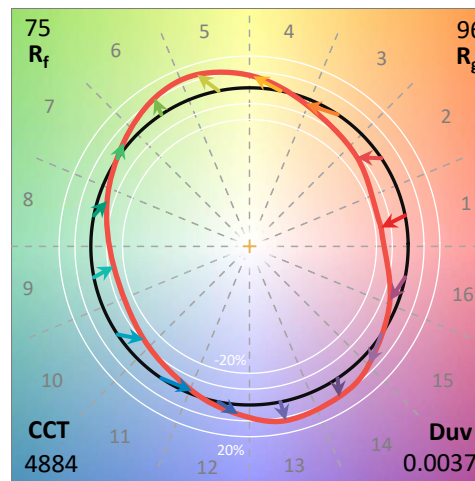
**Test Information**

Test Method: LM-79-2008  
 Report Number: SP1-1908-441-4-R4  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry: 4π  
 Issue Date: 10/28/2024  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: McGRAW-EDISON  
 Catalog Number: **SA1C-750-U-5WQ**  
 Description: McGRAW EDISON ROADWAY AND AREA LUMINAIRE

\*\*\*THIS IS A REVISION OF SP1-1908-441-4-R3. TO UPDATE THE CATALOG INFORMATION.\*\*\*TESTED IN SITU. ROADWAY AND AREA LUMINAIRE. (1) 70 CRI, 5000K, 1050MA LIGHTSQUARE WITH 16 LEDS AND TYPE V WIDE OPTICS.

**Spectral Parameters**

|                           |        |           |      |      |       |
|---------------------------|--------|-----------|------|------|-------|
| CCT (K):                  | 4884   | CRI (Ra): | 73.5 | R9:  | -28.4 |
| CIE u':                   | 0.2101 | R1:       | 70.5 | R10: | 48.6  |
| CIE v':                   | 0.4904 | R2:       | 77.7 | R11: | 73.2  |
| Duv:                      | 0.0037 | R3:       | 84.6 | R12: | 50.7  |
| CIE x:                    | 0.3493 | R4:       | 74.7 | R13: | 71.2  |
| CIE y:                    | 0.3624 | R5:       | 71.9 | R14: | 91.4  |
| CIE z:                    | 0.2884 | R6:       | 70.7 |      |       |
| Peak Wavelength (nm):     | 444    | R7:       | 81.2 |      |       |
| Dominant Wavelength (nm): | 571    | R8:       | 56.9 |      |       |
| Purity:                   | 13.7   |           |      |      |       |
| Rf:                       | 74.9   |           |      |      |       |
| Rg:                       | 96.3   |           |      |      |       |



**Test Conditions**

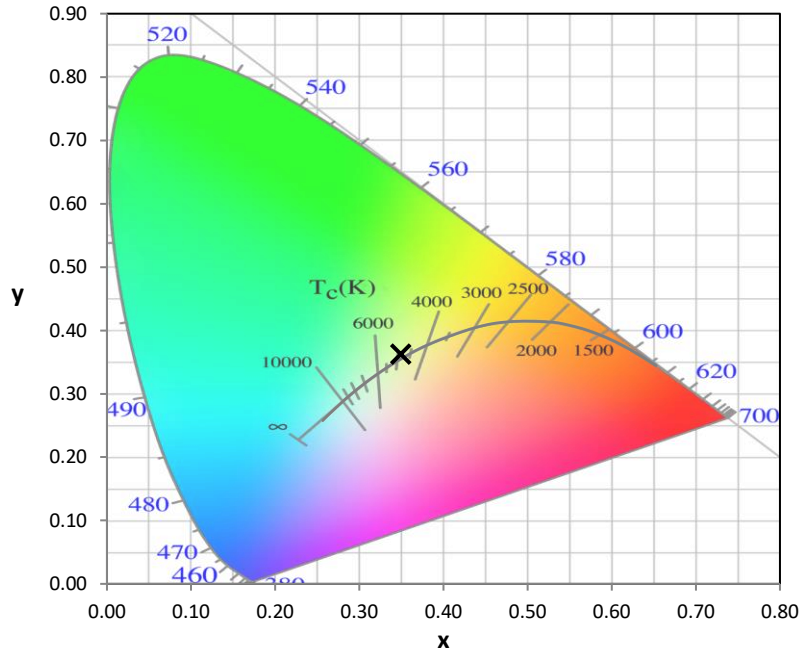
Stabilization Time: 240M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 25.0./44%  
 Sphere Temperature (°C): 25.7

REPORT NUMBER: SP1-1908-441-4-R4

| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | IN0058                | 6/28/2019        | 12/28/2019           |
| Power Meter                    | IN0071                | 12/5/2018        | 12/5/2019            |
| AC Power Source                | IN0063                | 12/5/2018        | 12/5/2019            |
| DC Power Source                | IN0208                | 12/5/2018        | 12/5/2019            |
| Sphere Thermometer             | IN0085                | 12/5/2018        | 12/5/2019            |
| Room Thermometer               | IN0046                | 12/5/2018        | 12/5/2019            |

REPORT NUMBER: SP1-1908-441-4-R4

CIE 1931 Chromaticity Diagram



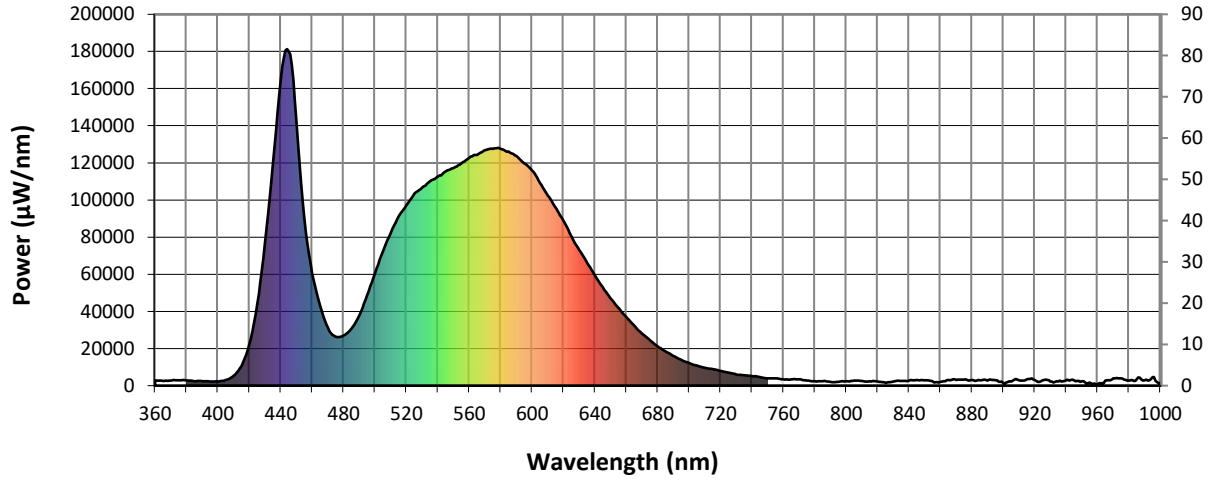
CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles



Point lies inside the ANSI 5000K 4-step quadrangle

REPORT NUMBER: SP1-1908-441-4-R4

**Photopic Flux vs. Wavelength**



#####

| $\lambda$<br>(nm) | Power<br>( $\mu$ W/nm) | Lumens<br>( $\phi$ /nm) | $\lambda$<br>(nm) | Power<br>( $\mu$ W/nm) | Lumens<br>( $\phi$ /nm) | $\lambda$<br>(nm) | Power<br>( $\mu$ W/nm) | Lumens<br>( $\phi$ /nm) | $\lambda$<br>(nm) | Power<br>( $\mu$ W/nm) | Lumens<br>( $\phi$ /nm) | $\lambda$<br>(nm) | Power<br>( $\mu$ W/nm) | Lumens<br>( $\phi$ /nm) |
|-------------------|------------------------|-------------------------|-------------------|------------------------|-------------------------|-------------------|------------------------|-------------------------|-------------------|------------------------|-------------------------|-------------------|------------------------|-------------------------|
| 360               | 2945                   | NR                      | 490               | 37941                  | NR                      | 620               | 88803                  | NR                      | 750               | 3908                   | NR                      | 880               | 2997                   | NR                      |
| 365               | 2596                   | NR                      | 495               | 48525                  | NR                      | 625               | 80578                  | NR                      | 755               | 3988                   | NR                      | 885               | 2927                   | NR                      |
| 370               | 2732                   | NR                      | 500               | 60609                  | NR                      | 630               | 73127                  | NR                      | 760               | 3335                   | NR                      | 890               | 2649                   | NR                      |
| 375               | 2894                   | NR                      | 505               | 72036                  | NR                      | 635               | 66244                  | NR                      | 765               | 3438                   | NR                      | 895               | 2828                   | NR                      |
| 380               | 2822                   | NR                      | 510               | 82168                  | NR                      | 640               | 59440                  | NR                      | 770               | 3427                   | NR                      | 900               | 1407                   | NR                      |
| 385               | 2394                   | NR                      | 515               | 90898                  | NR                      | 645               | 52864                  | NR                      | 775               | 2759                   | NR                      | 905               | 2224                   | NR                      |
| 390               | 2370                   | NR                      | 520               | 97142                  | NR                      | 650               | 47085                  | NR                      | 780               | 2340                   | NR                      | 910               | 2905                   | NR                      |
| 395               | 2267                   | NR                      | 525               | 103255                 | NR                      | 655               | 41789                  | NR                      | 785               | 2412                   | NR                      | 915               | 3350                   | NR                      |
| 400               | 2262                   | NR                      | 530               | 106697                 | NR                      | 660               | 37064                  | NR                      | 790               | 1999                   | NR                      | 920               | 3114                   | NR                      |
| 405               | 3000                   | NR                      | 535               | 110081                 | NR                      | 665               | 32299                  | NR                      | 795               | 2054                   | NR                      | 925               | 2834                   | NR                      |
| 410               | 5324                   | NR                      | 540               | 112494                 | NR                      | 670               | 28142                  | NR                      | 800               | 2331                   | NR                      | 930               | 2271                   | NR                      |
| 415               | 10725                  | NR                      | 545               | 115513                 | NR                      | 675               | 24505                  | NR                      | 805               | 2648                   | NR                      | 935               | 2228                   | NR                      |
| 420               | 22128                  | NR                      | 550               | 117203                 | NR                      | 680               | 21162                  | NR                      | 810               | 2485                   | NR                      | 940               | 2833                   | NR                      |
| 425               | 44095                  | NR                      | 555               | 119753                 | NR                      | 685               | 18400                  | NR                      | 815               | 2409                   | NR                      | 945               | 2941                   | NR                      |
| 430               | 77002                  | NR                      | 560               | 122602                 | NR                      | 690               | 16065                  | NR                      | 820               | 2221                   | NR                      | 950               | 2323                   | NR                      |
| 435               | 119881                 | NR                      | 565               | 124314                 | NR                      | 695               | 13860                  | NR                      | 825               | 1562                   | NR                      | 955               | 1667                   | NR                      |
| 440               | 164454                 | NR                      | 570               | 126775                 | NR                      | 700               | 12177                  | NR                      | 830               | 2249                   | NR                      | 960               | 749                    | NR                      |
| 445               | 179997                 | NR                      | 575               | 127511                 | NR                      | 705               | 10757                  | NR                      | 835               | 2573                   | NR                      | 965               | 2669                   | NR                      |
| 450               | 142822                 | NR                      | 580               | 127577                 | NR                      | 710               | 9601                   | NR                      | 840               | 2764                   | NR                      | 970               | 3968                   | NR                      |
| 455               | 90008                  | NR                      | 585               | 126153                 | NR                      | 715               | 8944                   | NR                      | 845               | 3109                   | NR                      | 975               | 3886                   | NR                      |
| 460               | 60557                  | NR                      | 590               | 123678                 | NR                      | 720               | 7947                   | NR                      | 850               | 2963                   | NR                      | 980               | 2788                   | NR                      |
| 465               | 43305                  | NR                      | 595               | 119774                 | NR                      | 725               | 7062                   | NR                      | 855               | 2336                   | NR                      | 985               | 3496                   | NR                      |
| 470               | 31089                  | NR                      | 600               | 115733                 | NR                      | 730               | 6004                   | NR                      | 860               | 2118                   | NR                      | 990               | 2913                   | NR                      |
| 475               | 26278                  | NR                      | 605               | 109231                 | NR                      | 735               | 5594                   | NR                      | 865               | 3144                   | NR                      | 995               | 4659                   | NR                      |
| 480               | 27060                  | NR                      | 610               | 102408                 | NR                      | 740               | 5165                   | NR                      | 870               | 3069                   | NR                      | 1000              | 1308                   | NR                      |
| 485               | 30698                  | NR                      | 615               | 96015                  | NR                      | 745               | 4687                   | NR                      | 875               | 3311                   | NR                      |                   |                        |                         |

REPORT NUMBER: SP1-1908-441-4-R4

Scotopic Flux vs. Wavelength



Scotopic Lumens: 13493.5 S/P: 1.77

| λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) |
|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|
| 360    | 2945          | NR            | 490    | 37941         | NR            | 620    | 88803         | NR            | 750    | 3908          | NR            | 880    | 2997          | NR            |
| 365    | 2596          | NR            | 495    | 48525         | NR            | 625    | 80578         | NR            | 755    | 3988          | NR            | 885    | 2927          | NR            |
| 370    | 2732          | NR            | 500    | 60609         | NR            | 630    | 73127         | NR            | 760    | 3335          | NR            | 890    | 2649          | NR            |
| 375    | 2894          | NR            | 505    | 72036         | NR            | 635    | 66244         | NR            | 765    | 3438          | NR            | 895    | 2828          | NR            |
| 380    | 2822          | NR            | 510    | 82168         | NR            | 640    | 59440         | NR            | 770    | 3427          | NR            | 900    | 1407          | NR            |
| 385    | 2394          | NR            | 515    | 90898         | NR            | 645    | 52864         | NR            | 775    | 2759          | NR            | 905    | 2224          | NR            |
| 390    | 2370          | NR            | 520    | 97142         | NR            | 650    | 47085         | NR            | 780    | 2340          | NR            | 910    | 2905          | NR            |
| 395    | 2267          | NR            | 525    | 103255        | NR            | 655    | 41789         | NR            | 785    | 2412          | NR            | 915    | 3350          | NR            |
| 400    | 2262          | NR            | 530    | 106697        | NR            | 660    | 37064         | NR            | 790    | 1999          | NR            | 920    | 3114          | NR            |
| 405    | 3000          | NR            | 535    | 110081        | NR            | 665    | 32299         | NR            | 795    | 2054          | NR            | 925    | 2834          | NR            |
| 410    | 5324          | NR            | 540    | 112494        | NR            | 670    | 28142         | NR            | 800    | 2331          | NR            | 930    | 2271          | NR            |
| 415    | 10725         | NR            | 545    | 115513        | NR            | 675    | 24505         | NR            | 805    | 2648          | NR            | 935    | 2228          | NR            |
| 420    | 22128         | NR            | 550    | 117203        | NR            | 680    | 21162         | NR            | 810    | 2485          | NR            | 940    | 2833          | NR            |
| 425    | 44095         | NR            | 555    | 119753        | NR            | 685    | 18400         | NR            | 815    | 2409          | NR            | 945    | 2941          | NR            |
| 430    | 77002         | NR            | 560    | 122602        | NR            | 690    | 16065         | NR            | 820    | 2221          | NR            | 950    | 2323          | NR            |
| 435    | 119881        | NR            | 565    | 124314        | NR            | 695    | 13860         | NR            | 825    | 1562          | NR            | 955    | 1667          | NR            |
| 440    | 164454        | NR            | 570    | 126775        | NR            | 700    | 12177         | NR            | 830    | 2249          | NR            | 960    | 749           | NR            |
| 445    | 179997        | NR            | 575    | 127511        | NR            | 705    | 10757         | NR            | 835    | 2573          | NR            | 965    | 2669          | NR            |
| 450    | 142822        | NR            | 580    | 127577        | NR            | 710    | 9601          | NR            | 840    | 2764          | NR            | 970    | 3968          | NR            |
| 455    | 90008         | NR            | 585    | 126153        | NR            | 715    | 8944          | NR            | 845    | 3109          | NR            | 975    | 3886          | NR            |
| 460    | 60557         | NR            | 590    | 123678        | NR            | 720    | 7947          | NR            | 850    | 2963          | NR            | 980    | 2788          | NR            |
| 465    | 43305         | NR            | 595    | 119774        | NR            | 725    | 7062          | NR            | 855    | 2336          | NR            | 985    | 3496          | NR            |
| 470    | 31089         | NR            | 600    | 115733        | NR            | 730    | 6004          | NR            | 860    | 2118          | NR            | 990    | 2913          | NR            |
| 475    | 26278         | NR            | 605    | 109231        | NR            | 735    | 5594          | NR            | 865    | 3144          | NR            | 995    | 4659          | NR            |
| 480    | 27060         | NR            | 610    | 102408        | NR            | 740    | 5165          | NR            | 870    | 3069          | NR            | 1000   | 1308          | NR            |
| 485    | 30698         | NR            | 615    | 96015         | NR            | 745    | 4687          | NR            | 875    | 3311          | NR            |        |               |               |

REPORT NUMBER: SP1-1908-441-4-R4

Melanopic Flux vs. Wavelength



Melanopic Lumens: 5378.9

M/P: 0.71

| λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) |
|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|
| 360    | 2945          | NR            | 490    | 37941         | NR            | 620    | 88803         | NR            | 750    | 3908          | NR            | 880    | 2997          | NR            |
| 365    | 2596          | NR            | 495    | 48525         | NR            | 625    | 80578         | NR            | 755    | 3988          | NR            | 885    | 2927          | NR            |
| 370    | 2732          | NR            | 500    | 60609         | NR            | 630    | 73127         | NR            | 760    | 3335          | NR            | 890    | 2649          | NR            |
| 375    | 2894          | NR            | 505    | 72036         | NR            | 635    | 66244         | NR            | 765    | 3438          | NR            | 895    | 2828          | NR            |
| 380    | 2822          | NR            | 510    | 82168         | NR            | 640    | 59440         | NR            | 770    | 3427          | NR            | 900    | 1407          | NR            |
| 385    | 2394          | NR            | 515    | 90898         | NR            | 645    | 52864         | NR            | 775    | 2759          | NR            | 905    | 2224          | NR            |
| 390    | 2370          | NR            | 520    | 97142         | NR            | 650    | 47085         | NR            | 780    | 2340          | NR            | 910    | 2905          | NR            |
| 395    | 2267          | NR            | 525    | 103255        | NR            | 655    | 41789         | NR            | 785    | 2412          | NR            | 915    | 3350          | NR            |
| 400    | 2262          | NR            | 530    | 106697        | NR            | 660    | 37064         | NR            | 790    | 1999          | NR            | 920    | 3114          | NR            |
| 405    | 3000          | NR            | 535    | 110081        | NR            | 665    | 32299         | NR            | 795    | 2054          | NR            | 925    | 2834          | NR            |
| 410    | 5324          | NR            | 540    | 112494        | NR            | 670    | 28142         | NR            | 800    | 2331          | NR            | 930    | 2271          | NR            |
| 415    | 10725         | NR            | 545    | 115513        | NR            | 675    | 24505         | NR            | 805    | 2648          | NR            | 935    | 2228          | NR            |
| 420    | 22128         | NR            | 550    | 117203        | NR            | 680    | 21162         | NR            | 810    | 2485          | NR            | 940    | 2833          | NR            |
| 425    | 44095         | NR            | 555    | 119753        | NR            | 685    | 18400         | NR            | 815    | 2409          | NR            | 945    | 2941          | NR            |
| 430    | 77002         | NR            | 560    | 122602        | NR            | 690    | 16065         | NR            | 820    | 2221          | NR            | 950    | 2323          | NR            |
| 435    | 119881        | NR            | 565    | 124314        | NR            | 695    | 13860         | NR            | 825    | 1562          | NR            | 955    | 1667          | NR            |
| 440    | 164454        | NR            | 570    | 126775        | NR            | 700    | 12177         | NR            | 830    | 2249          | NR            | 960    | 749           | NR            |
| 445    | 179997        | NR            | 575    | 127511        | NR            | 705    | 10757         | NR            | 835    | 2573          | NR            | 965    | 2669          | NR            |
| 450    | 142822        | NR            | 580    | 127577        | NR            | 710    | 9601          | NR            | 840    | 2764          | NR            | 970    | 3968          | NR            |
| 455    | 90008         | NR            | 585    | 126153        | NR            | 715    | 8944          | NR            | 845    | 3109          | NR            | 975    | 3886          | NR            |
| 460    | 60557         | NR            | 590    | 123678        | NR            | 720    | 7947          | NR            | 850    | 2963          | NR            | 980    | 2788          | NR            |
| 465    | 43305         | NR            | 595    | 119774        | NR            | 725    | 7062          | NR            | 855    | 2336          | NR            | 985    | 3496          | NR            |
| 470    | 31089         | NR            | 600    | 115733        | NR            | 730    | 6004          | NR            | 860    | 2118          | NR            | 990    | 2913          | NR            |
| 475    | 26278         | NR            | 605    | 109231        | NR            | 735    | 5594          | NR            | 865    | 3144          | NR            | 995    | 4659          | NR            |
| 480    | 27060         | NR            | 610    | 102408        | NR            | 740    | 5165          | NR            | 870    | 3069          | NR            | 1000   | 1308          | NR            |
| 485    | 30698         | NR            | 615    | 96015         | NR            | 745    | 4687          | NR            | 875    | 3311          | NR            |        |               |               |

REPORT NUMBER: SP1-1908-441-4-R4

TM-30-18

**Summary**

$R_f = 74.9$   
 $R_g = 96.3$   
 $CIE R_a = 73.5$   
 $R_g = -28.4$



**Color Vector Graphics**

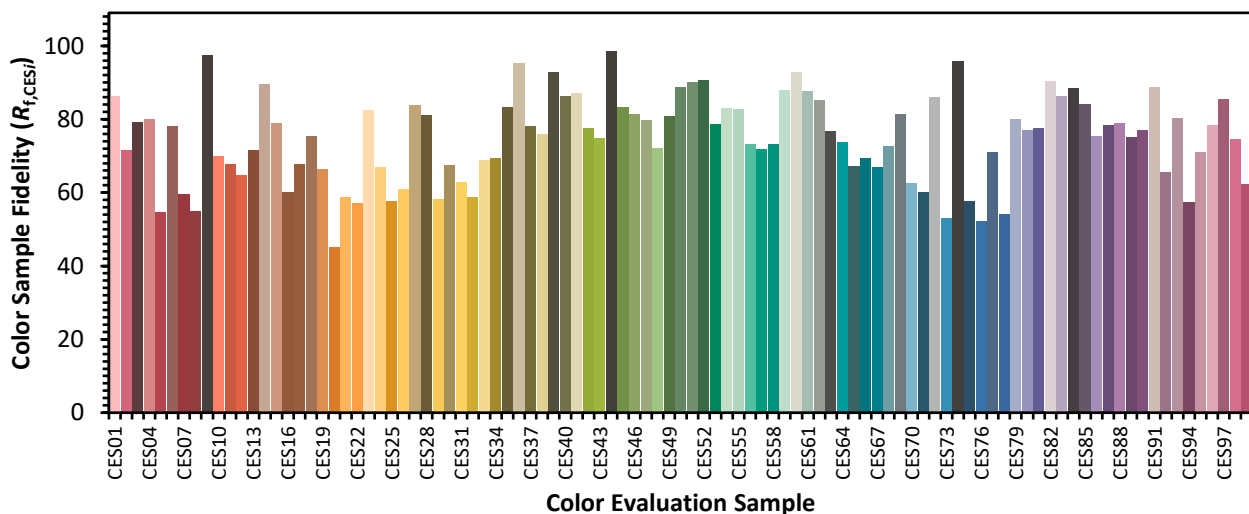


REPORT NUMBER: SP1-1908-441-4-R4

TM-30-18

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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 61 | CES51 = 90 | CES76 = 52 |
| CES02 = 60 | CES27 = 84 | CES52 = 91 | CES77 = 71 |
| CES03 = 30 | CES28 = 81 | CES53 = 79 | CES78 = 54 |
| CES04 = 69 | CES29 = 58 | CES54 = 83 | CES79 = 80 |
| CES05 = 46 | CES30 = 67 | CES55 = 83 | CES80 = 77 |
| CES06 = 50 | CES31 = 63 | CES56 = 73 | CES81 = 77 |
| CES07 = 39 | CES32 = 59 | CES57 = 72 | CES82 = 90 |
| CES08 = 38 | CES33 = 69 | CES58 = 73 | CES83 = 86 |
| CES09 = 29 | CES34 = 69 | CES59 = 88 | CES84 = 88 |
| CES10 = 73 | CES35 = 83 | CES60 = 93 | CES85 = 84 |
| CES11 = 56 | CES36 = 95 | CES61 = 88 | CES86 = 75 |
| CES12 = 61 | CES37 = 78 | CES62 = 85 | CES87 = 78 |
| CES13 = 41 | CES38 = 76 | CES63 = 77 | CES88 = 79 |
| CES14 = 74 | CES39 = 93 | CES64 = 74 | CES89 = 75 |
| CES15 = 70 | CES40 = 86 | CES65 = 67 | CES90 = 77 |
| CES16 = 46 | CES41 = 87 | CES66 = 69 | CES91 = 89 |
| CES17 = 49 | CES42 = 78 | CES67 = 67 | CES92 = 66 |
| CES18 = 55 | CES43 = 75 | CES68 = 73 | CES93 = 80 |
| CES19 = 71 | CES44 = 99 | CES69 = 81 | CES94 = 57 |
| CES20 = 64 | CES45 = 83 | CES70 = 63 | CES95 = 71 |
| CES21 = 85 | CES46 = 81 | CES71 = 60 | CES96 = 78 |
| CES22 = 77 | CES47 = 80 | CES72 = 86 | CES97 = 85 |
| CES23 = 91 | CES48 = 72 | CES73 = 53 | CES98 = 75 |
| CES24 = 90 | CES49 = 81 | CES74 = 96 | CES99 = 62 |
| CES25 = 71 | CES50 = 89 | CES75 = 58 |            |





REPORT NUMBER: SP1-1908-441-4-R4

TM-30-18

Color Rendition by Hue-Angle Bin



REPORT NUMBER: SP1-1908-441-4-R4

TM-30-18

Measure Comparisons



(END OF REPORT)