

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: STREETWORKS

Report Number: P360421

Luminaire Tested: NVN-SA3B-727-U-5MQ

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-2019  
Report Number: P360421  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-6)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: STREETWORKS  
Catalog Number: NVN-SA3B-727-U-5MQ  
Description: NAVION ROADWAY AND AREA LUMINAIRE  
(3) 70 CRI, 2700K, 800mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE V MEDIUM OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 15489 lumens  
Efficiency: N/A  
Efficacy: 124.9 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 1.5' x H: 0')  
IES Classification: Type V - Short  
BUG Rating: B4 - U0 - G2

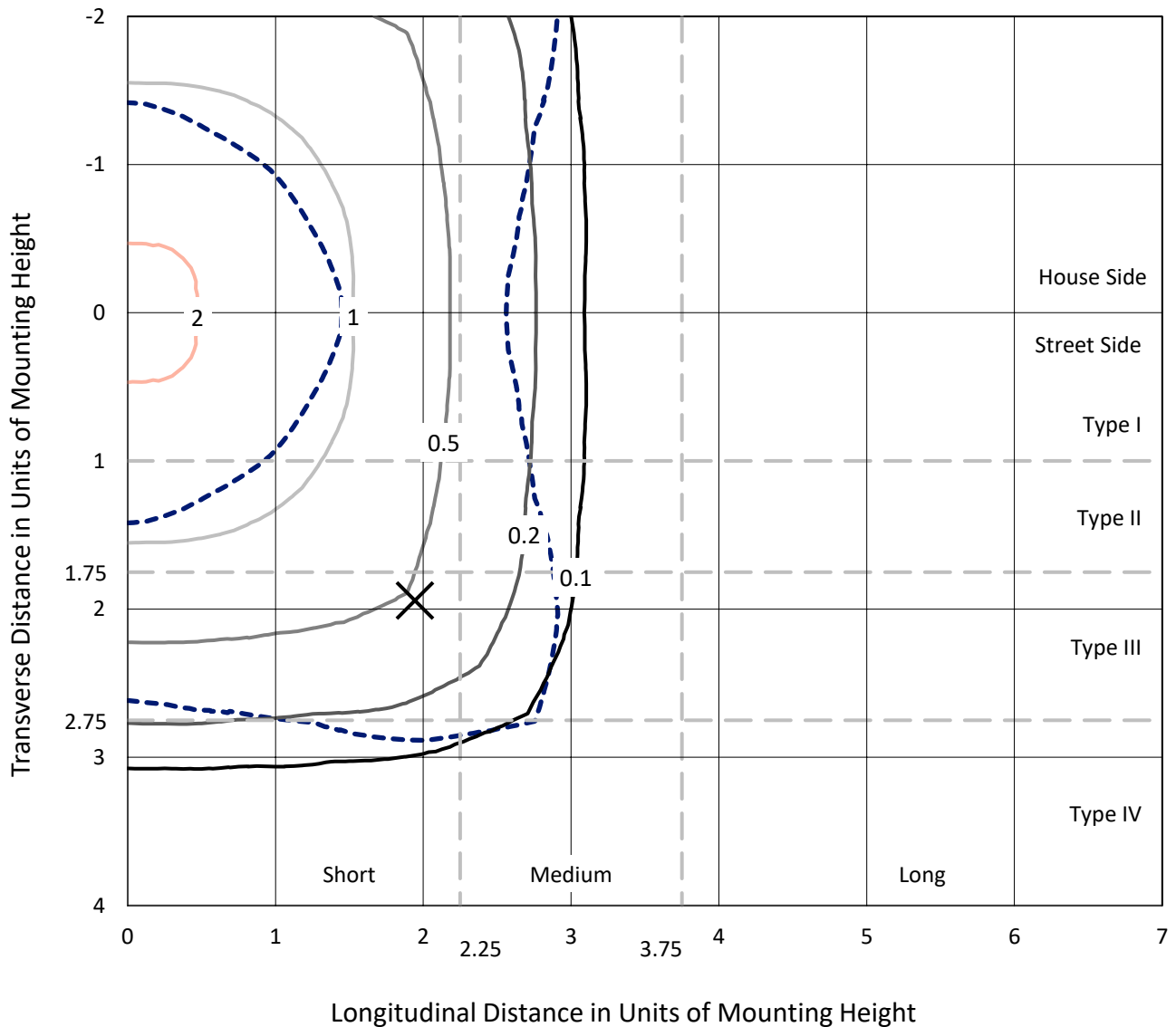
Input Watts (W): 124  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 28.75 FT



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### Iso-Footcandle Lines of Horizontal Illumination

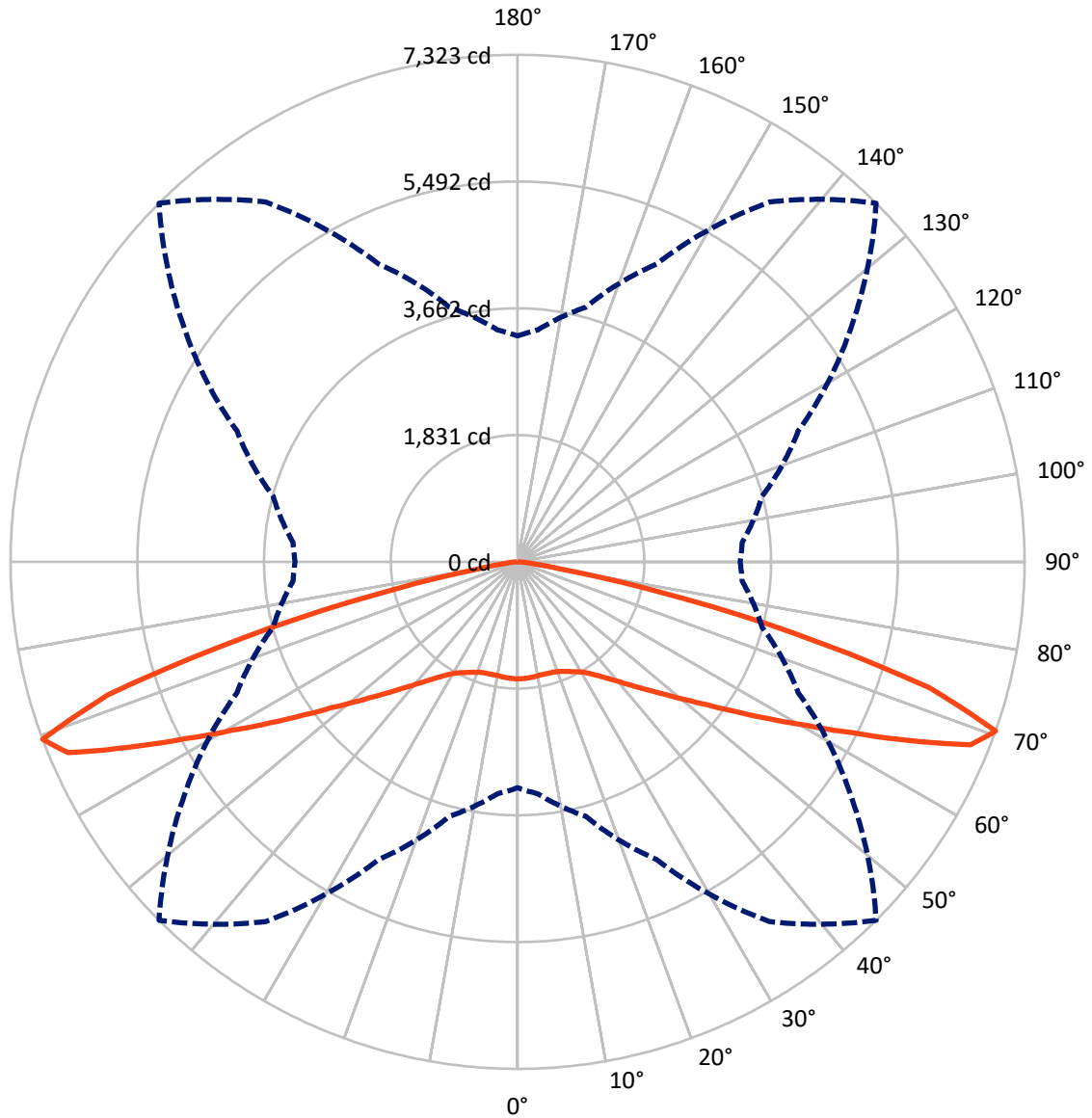
× Max cd  
 - - - 1/2 Max cd



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

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### Luminous Intensity Polar Plot



— Vertical Plane Through 45-Deg Lateral      - - - Horizontal Cone Through 70-Deg Vertical

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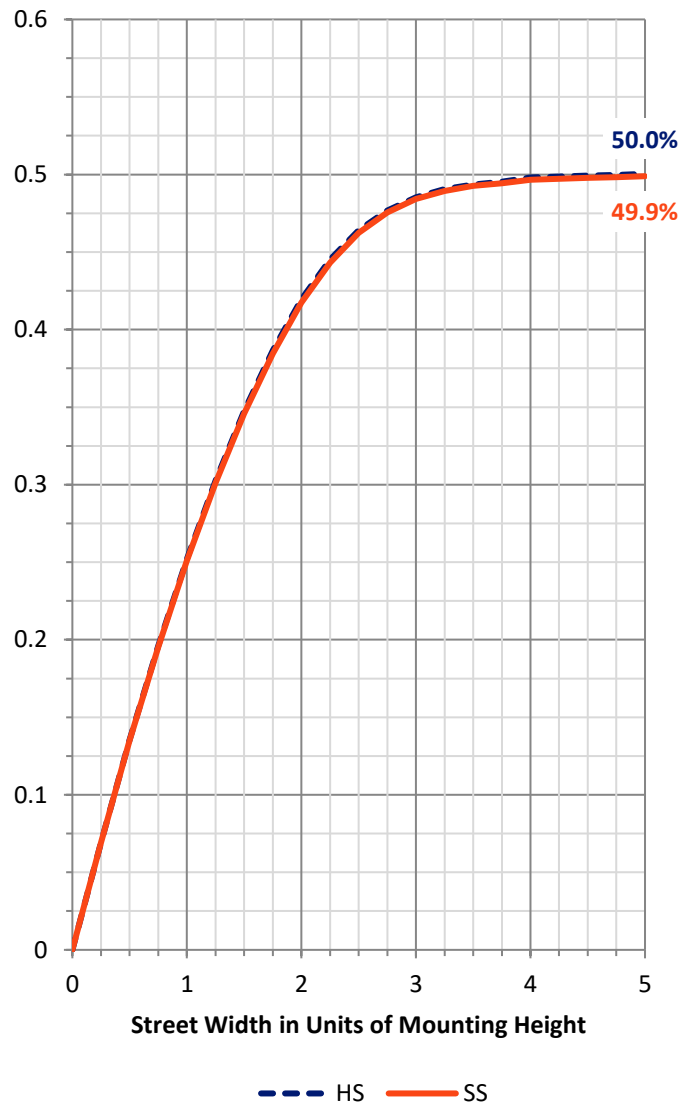
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 7744.5   | 0.0    | 7744.5  |
|                    | % Fixture | 50.0     | 0.0    | 50.0    |
| <b>Street Side</b> | Lumens    | 7744.5   | 0.0    | 7744.5  |
|                    | % Fixture | 50.0     | 0.0    | 50.0    |
| <b>Total</b>       | Lumens    | 15489.0  | 0.0    | 15489.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 160.2   | 1.0       |
| 10°-20°   | 470.4   | 3.0       |
| 20°-30°   | 800.7   | 5.2       |
| 30°-40°   | 1269.9  | 8.2       |
| 40°-50°   | 2066.5  | 13.3      |
| 50°-60°   | 3407.3  | 22.0      |
| 60°-70°   | 5002.0  | 32.3      |
| 70°-80°   | 2211.9  | 14.3      |
| 80°-90°   | 100.2   | 0.6       |
| 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°    | 15489.0 | 100.0     |
| 0°-180°   | 15489.0 | 100.0     |

**Coefficient of Utilization**

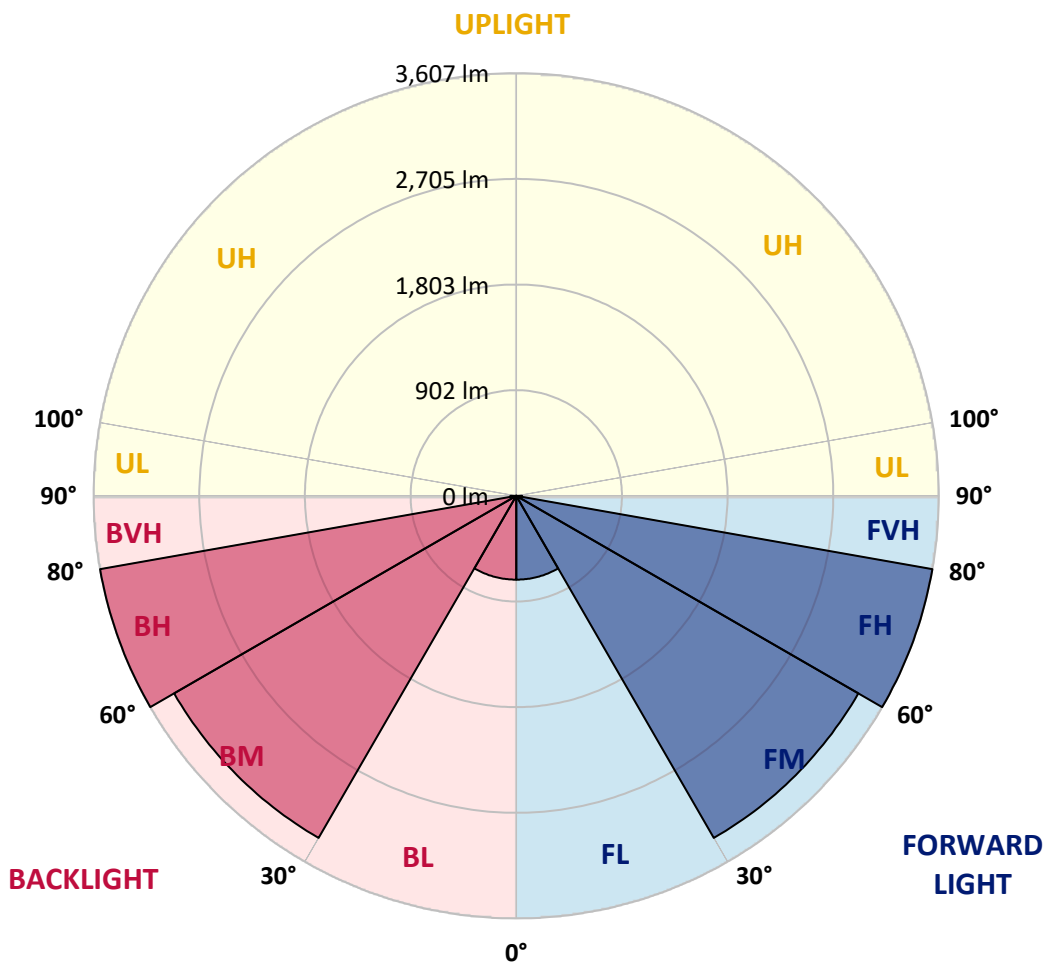


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**LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:**

| Zone           | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|----------------|--------|-----------|-------------------------|------|---------|
|                |        |           | B                       | U    | G       |
| FL (0°-30°)    | 715.6  | 4.6       |                         |      |         |
| FM (30°-60°)   | 3371.8 | 21.8      |                         |      |         |
| FH (60°-80°)   | 3606.9 | 23.3      |                         |      | G2/5000 |
| FVH (80°-90°)  | 50.1   | 0.3       |                         |      | G1/100  |
| BL (0°-30°)    | 715.6  | 4.6       | B2/1000                 |      |         |
| BM (30°-60°)   | 3371.8 | 21.8      | B3/5000                 |      |         |
| BH (60°-80°)   | 3606.9 | 23.3      | B4/5000                 |      | G2/5000 |
| BVH (80°-90°)  | 50.1   | 0.3       |                         |      | G1/100  |
| UL (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B4-U0-G2**  
 Type V Short





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 65°    | 75°    | 85°    | 90°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1691.6 | 1691.6 | 1691.6 | 1691.6 | 1691.6 | 1691.6 | 1691.6 | 1691.6 | 1691.6 | 1691.6 | 1691.6 |
| 2.5°  | 1689.1 | 1687.5 | 1691.1 | 1690.6 | 1687.5 | 1688.1 | 1688.1 | 1689.6 | 1689.6 | 1688.6 | 1688.6 |
| 5°    | 1682.9 | 1681.9 | 1686.0 | 1686.0 | 1682.9 | 1684.0 | 1685.0 | 1686.5 | 1686.0 | 1685.0 | 1684.5 |
| 7.5°  | 1675.2 | 1674.7 | 1678.8 | 1678.8 | 1676.8 | 1677.8 | 1676.8 | 1677.3 | 1676.3 | 1675.2 | 1673.7 |
| 10°   | 1662.4 | 1663.4 | 1667.0 | 1668.1 | 1668.1 | 1668.6 | 1667.5 | 1665.0 | 1663.4 | 1661.9 | 1660.4 |
| 12.5° | 1650.6 | 1650.1 | 1655.2 | 1657.8 | 1661.9 | 1666.5 | 1663.4 | 1656.3 | 1653.2 | 1650.1 | 1649.1 |
| 15°   | 1642.9 | 1643.5 | 1648.6 | 1653.2 | 1660.4 | 1670.1 | 1666.5 | 1655.2 | 1649.1 | 1645.5 | 1644.5 |
| 17.5° | 1641.4 | 1642.4 | 1649.1 | 1657.3 | 1665.0 | 1675.7 | 1673.7 | 1662.4 | 1652.2 | 1645.5 | 1644.0 |
| 20°   | 1645.0 | 1645.5 | 1655.8 | 1667.5 | 1680.9 | 1691.1 | 1686.5 | 1674.2 | 1660.4 | 1650.1 | 1647.6 |
| 22.5° | 1651.7 | 1653.7 | 1666.5 | 1685.0 | 1705.5 | 1719.3 | 1713.7 | 1692.7 | 1671.1 | 1658.3 | 1654.7 |
| 25°   | 1672.7 | 1673.2 | 1690.6 | 1715.7 | 1740.3 | 1756.2 | 1749.6 | 1719.8 | 1692.2 | 1677.8 | 1673.2 |
| 27.5° | 1716.2 | 1717.8 | 1735.2 | 1764.4 | 1785.4 | 1795.7 | 1791.6 | 1767.5 | 1743.9 | 1728.5 | 1730.1 |
| 30°   | 1779.3 | 1781.3 | 1800.8 | 1833.1 | 1845.9 | 1848.5 | 1847.5 | 1836.2 | 1814.7 | 1794.2 | 1795.7 |
| 32.5° | 1856.2 | 1857.2 | 1883.4 | 1912.6 | 1922.8 | 1924.9 | 1922.8 | 1912.6 | 1886.9 | 1859.3 | 1860.8 |
| 35°   | 1955.1 | 1958.2 | 1983.3 | 2011.5 | 2019.7 | 2023.8 | 2020.2 | 2006.9 | 1980.2 | 1953.1 | 1952.0 |
| 37.5° | 2077.1 | 2077.6 | 2103.8 | 2133.0 | 2143.3 | 2144.3 | 2140.2 | 2131.5 | 2098.1 | 2073.5 | 2072.0 |
| 40°   | 2218.6 | 2220.7 | 2251.4 | 2282.7 | 2286.8 | 2282.2 | 2287.8 | 2282.7 | 2248.3 | 2220.1 | 2224.8 |
| 42.5° | 2390.9 | 2395.5 | 2432.4 | 2463.1 | 2451.3 | 2448.8 | 2452.4 | 2453.9 | 2426.2 | 2391.9 | 2388.8 |
| 45°   | 2591.3 | 2595.4 | 2641.5 | 2666.1 | 2658.4 | 2641.5 | 2648.7 | 2661.0 | 2622.6 | 2580.0 | 2584.1 |
| 47.5° | 2819.9 | 2830.2 | 2879.4 | 2902.4 | 2883.5 | 2860.4 | 2874.2 | 2892.7 | 2847.6 | 2794.8 | 2792.2 |
| 50°   | 3074.2 | 3087.0 | 3152.6 | 3184.9 | 3165.9 | 3123.4 | 3146.5 | 3158.8 | 3093.7 | 3025.5 | 3019.8 |
| 52.5° | 3345.3 | 3358.2 | 3440.7 | 3507.3 | 3495.0 | 3428.9 | 3461.2 | 3448.4 | 3373.5 | 3281.8 | 3274.6 |
| 55°   | 3652.4 | 3657.5 | 3746.7 | 3854.4 | 3866.7 | 3818.0 | 3815.9 | 3794.9 | 3684.2 | 3578.1 | 3572.9 |
| 57.5° | 3968.2 | 3971.8 | 4087.1 | 4214.2 | 4272.2 | 4272.2 | 4214.7 | 4170.1 | 4023.0 | 3900.0 | 3887.2 |
| 60°   | 4309.1 | 4321.9 | 4449.5 | 4622.3 | 4757.6 | 4797.6 | 4696.1 | 4574.6 | 4414.7 | 4264.5 | 4249.6 |
| 62.5° | 4612.5 | 4627.4 | 4822.7 | 5080.0 | 5297.4 | 5443.0 | 5194.9 | 4997.0 | 4705.8 | 4464.9 | 4436.7 |
| 65°   | 4651.0 | 4691.0 | 4975.5 | 5441.4 | 5927.9 | 6218.6 | 5742.9 | 5255.4 | 4724.8 | 4390.1 | 4361.4 |
| 67.5° | 4247.6 | 4315.2 | 4699.7 | 5425.0 | 6430.3 | 7054.1 | 6093.0 | 5107.7 | 4384.4 | 4014.3 | 3982.5 |
| 70°   | 3263.8 | 3362.3 | 3805.7 | 4745.3 | 6343.6 | 7323.3 | 5873.6 | 4471.6 | 3655.5 | 3257.2 | 3212.6 |
| 72.5° | 1790.6 | 1831.1 | 2229.9 | 3249.5 | 5085.7 | 6223.2 | 4899.1 | 3306.4 | 2424.2 | 1972.6 | 1897.7 |
| 75°   | 568.0  | 582.3  | 785.3  | 1329.7 | 2876.8 | 4122.0 | 3112.1 | 1622.9 | 893.5  | 658.7  | 651.0  |
| 77.5° | 252.2  | 253.7  | 284.0  | 388.1  | 990.9  | 2088.4 | 1190.3 | 441.9  | 304.5  | 266.0  | 274.8  |
| 80°   | 159.4  | 159.4  | 175.8  | 192.2  | 269.6  | 606.4  | 321.9  | 210.2  | 179.4  | 166.6  | 170.2  |
| 82.5° | 76.4   | 84.6   | 114.3  | 123.0  | 148.1  | 204.0  | 165.1  | 137.4  | 120.0  | 89.2   | 83.0   |
| 85°   | 50.2   | 42.0   | 72.3   | 81.5   | 86.1   | 97.9   | 95.9   | 90.7   | 78.4   | 44.6   | 49.7   |
| 87.5° | 22.6   | 21.5   | 37.4   | 34.3   | 32.3   | 24.6   | 36.9   | 45.6   | 44.1   | 22.0   | 22.0   |
| 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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LM-79-2008: Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Report Prepared for

Cooper Lighting Solutions

McGRAW-EDISON

Report Number: SP1-1908-441-1-R4

Test Date: 08/20/2019

Luminaire Tested: SA1C-727-U-5WQ



**Test Information**

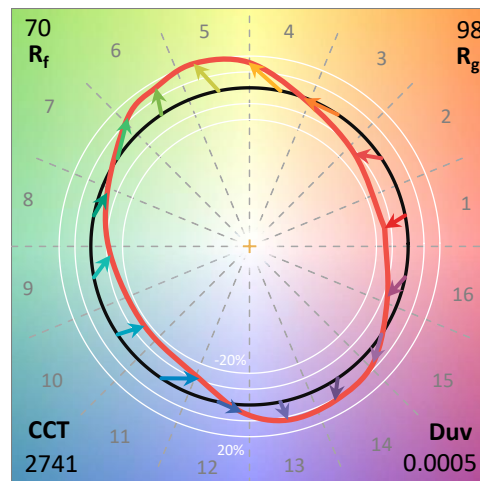
Test Method: LM-79-2008  
 Report Number: SP1-1908-441-1-R4  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry: 4π  
 Issue Date: 10/28/2024  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: McGRAW-EDISON  
 Catalog Number: **SA1C-727-U-5WQ**  
 Description: McGRAW EDISON ROADWAY AND AREA LUMINAIRE

\*\*\*THIS IS A REVISION OF SP1-1908-441-1-R3. TO UPDATE THE CATALOG NUMBER.\*\*\*TESTED IN  
 SITU. (1) 70 CRI, 2700K, 1050MA LIGHTSQUARE WITH 16 LEDS AND TYPE V WIDE OPTICS.

**Spectral Parameters**

CCT (K): 2741  
 CIE u': 0.2605  
 CIE v': 0.5272  
 Duv: 0.0005  
 CIE x: 0.4573  
 CIE y: 0.4113  
 CIE z: 0.1313  
 Peak Wavelength (nm): 602  
 Dominant Wavelength (nm): 583  
 Purity: 61.2  
 Rf: 69.9  
 Rg: 98.3

|           |      |      |       |
|-----------|------|------|-------|
| CRI (Ra): | 71.5 |      |       |
| R1:       | 69.2 | R9:  | -16.1 |
| R2:       | 79.4 | R10: | 51.4  |
| R3:       | 87.8 | R11: | 63.1  |
| R4:       | 69.4 | R12: | 42.0  |
| R5:       | 66.4 | R13: | 70.2  |
| R6:       | 69.8 | R14: | 92.4  |
| R7:       | 79.8 |      |       |
| R8:       | 50.1 |      |       |



**Test Conditions**

Stabilization Time: 56M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 25.3./42%  
 Sphere Temperature (°C): 25.7

REPORT NUMBER: SP1-1908-441-1-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            |

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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 2700K 4-step quadrangle

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**Photopic Flux vs. Wavelength**



**Photopic Lumens: 6211.7**

| 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    | 2044          | 0.0           | 490    | 7179          | 1.0           | 620    | 118034        | 30.7          | 750    | 8362          | 0.0           | 880    | 3128          | 0.0           |
| 365    | 2016          | 0.0           | 495    | 10476         | 1.9           | 625    | 111884        | 24.7          | 755    | 7635          | 0.0           | 885    | 3110          | 0.0           |
| 370    | 2020          | 0.0           | 500    | 15549         | 3.4           | 630    | 106119        | 19.2          | 760    | 6582          | 0.0           | 890    | 2632          | 0.0           |
| 375    | 2137          | 0.0           | 505    | 22477         | 6.3           | 635    | 99706         | 15.0          | 765    | 5777          | 0.0           | 895    | 2709          | 0.0           |
| 380    | 2046          | 0.0           | 510    | 30417         | 10.4          | 640    | 92142         | 11.0          | 770    | 5474          | 0.0           | 900    | 2016          | 0.0           |
| 385    | 1925          | 0.0           | 515    | 39274         | 16.3          | 645    | 84987         | 8.2           | 775    | 4977          | 0.0           | 905    | 1748          | 0.0           |
| 390    | 1893          | 0.0           | 520    | 47282         | 22.9          | 650    | 78016         | 5.7           | 780    | 4723          | 0.0           | 910    | 2046          | 0.0           |
| 395    | 1695          | 0.0           | 525    | 55413         | 29.7          | 655    | 71541         | 4.1           | 785    | 4219          | 0.0           | 915    | 1844          | 0.0           |
| 400    | 1633          | 0.0           | 530    | 62377         | 36.7          | 660    | 64863         | 2.7           | 790    | 3969          | 0.0           | 920    | 2734          | 0.0           |
| 405    | 2065          | 0.0           | 535    | 68520         | 42.5          | 665    | 58485         | 1.9           | 795    | 4122          | 0.0           | 925    | 2307          | 0.0           |
| 410    | 3449          | 0.0           | 540    | 73435         | 47.8          | 670    | 51641         | 1.1           | 800    | 2864          | 0.0           | 930    | 2039          | 0.0           |
| 415    | 7117          | 0.0           | 545    | 78677         | 52.4          | 675    | 46030         | 0.8           | 805    | 3151          | 0.0           | 935    | 1784          | 0.0           |
| 420    | 13992         | 0.0           | 550    | 83331         | 56.6          | 680    | 40590         | 0.5           | 810    | 3022          | 0.0           | 940    | 2464          | 0.0           |
| 425    | 25176         | 0.1           | 555    | 89120         | 60.9          | 685    | 35691         | 0.3           | 815    | 3471          | 0.0           | 945    | 2794          | 0.0           |
| 430    | 38151         | 0.3           | 560    | 94613         | 64.3          | 690    | 31631         | 0.2           | 820    | 2749          | 0.0           | 950    | 3090          | 0.0           |
| 435    | 49673         | 0.6           | 565    | 99818         | 66.4          | 695    | 27437         | 0.1           | 825    | 2729          | 0.0           | 955    | 1866          | 0.0           |
| 440    | 57273         | 0.9           | 570    | 106526        | 69.3          | 700    | 24589         | 0.1           | 830    | 2282          | 0.0           | 960    | 3110          | 0.0           |
| 445    | 54802         | 1.1           | 575    | 111610        | 69.4          | 705    | 21832         | 0.0           | 835    | 3140          | 0.0           | 965    | 3880          | 0.0           |
| 450    | 39184         | 1.0           | 580    | 117163        | 69.6          | 710    | 19500         | 0.0           | 840    | 2365          | 0.0           | 970    | 3243          | 0.0           |
| 455    | 22506         | 0.8           | 585    | 122201        | 67.9          | 715    | 17870         | 0.0           | 845    | 3024          | 0.0           | 975    | 2014          | 0.0           |
| 460    | 13692         | 0.6           | 590    | 125662        | 65.0          | 720    | 15924         | 0.0           | 850    | 2510          | 0.0           | 980    | 1688          | 0.0           |
| 465    | 9446          | 0.5           | 595    | 127415        | 60.4          | 725    | 14268         | 0.0           | 855    | 2739          | 0.0           | 985    | 2827          | 0.0           |
| 470    | 6698          | 0.4           | 600    | 129155        | 55.7          | 730    | 12438         | 0.0           | 860    | 3515          | 0.0           | 990    | 4172          | 0.0           |
| 475    | 5328          | 0.4           | 605    | 128057        | 49.6          | 735    | 11255         | 0.0           | 865    | 3600          | 0.0           | 995    | 3177          | 0.0           |
| 480    | 5081          | 0.5           | 610    | 126031        | 43.3          | 740    | 9951          | 0.0           | 870    | 3609          | 0.0           | 1000   | 3241          | 0.0           |
| 485    | 5579          | 0.7           | 615    | 123059        | 37.1          | 745    | 8870          | 0.0           | 875    | 3208          | 0.0           |        |               |               |

REPORT NUMBER: SP1-1908-441-1-R4

**Scotopic Flux vs. Wavelength**



**Scotopic Lumens: 6474.3**

**S/P: 1.04**

| 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    | 2044          | 0.0           | 490    | 7179          | 6.0           | 620    | 118034        | 0.1           | 750    | 8362          | 0.0           | 880    | 3128          | 0.0           |
| 365    | 2016          | 0.0           | 495    | 10476         | 8.6           | 625    | 111884        | 0.1           | 755    | 7635          | 0.0           | 885    | 3110          | 0.0           |
| 370    | 2020          | 0.0           | 500    | 15549         | 12.5          | 630    | 106119        | 0.0           | 760    | 6582          | 0.0           | 890    | 2632          | 0.0           |
| 375    | 2137          | 0.0           | 505    | 22477         | 17.3          | 635    | 99706         | 0.0           | 765    | 5777          | 0.0           | 895    | 2709          | 0.0           |
| 380    | 2046          | 0.0           | 510    | 30417         | 21.8          | 640    | 92142         | 0.0           | 770    | 5474          | 0.0           | 900    | 2016          | 0.0           |
| 385    | 1925          | 0.0           | 515    | 39274         | 25.7          | 645    | 84987         | 0.0           | 775    | 4977          | 0.0           | 905    | 1748          | 0.0           |
| 390    | 1893          | 0.0           | 520    | 47282         | 27.5          | 650    | 78016         | 0.0           | 780    | 4723          | 0.0           | 910    | 2046          | 0.0           |
| 395    | 1695          | 0.0           | 525    | 55413         | 28.1          | 655    | 71541         | 0.0           | 785    | 4219          | 0.0           | 915    | 1844          | 0.0           |
| 400    | 1633          | 0.0           | 530    | 62377         | 27.0          | 660    | 64863         | 0.0           | 790    | 3969          | 0.0           | 920    | 2734          | 0.0           |
| 405    | 2065          | 0.0           | 535    | 68520         | 24.7          | 665    | 58485         | 0.0           | 795    | 4122          | 0.0           | 925    | 2307          | 0.0           |
| 410    | 3449          | 0.1           | 540    | 73435         | 21.5          | 670    | 51641         | 0.0           | 800    | 2864          | 0.0           | 930    | 2039          | 0.0           |
| 415    | 7117          | 0.5           | 545    | 78677         | 18.3          | 675    | 46030         | 0.0           | 805    | 3151          | 0.0           | 935    | 1784          | 0.0           |
| 420    | 13992         | 1.6           | 550    | 83331         | 15.0          | 680    | 40590         | 0.0           | 810    | 3022          | 0.0           | 940    | 2464          | 0.0           |
| 425    | 25176         | 3.9           | 555    | 89120         | 12.0          | 685    | 35691         | 0.0           | 815    | 3471          | 0.0           | 945    | 2794          | 0.0           |
| 430    | 38151         | 8.1           | 560    | 94613         | 9.3           | 690    | 31631         | 0.0           | 820    | 2749          | 0.0           | 950    | 3090          | 0.0           |
| 435    | 49673         | 13.3          | 565    | 99818         | 7.0           | 695    | 27437         | 0.0           | 825    | 2729          | 0.0           | 955    | 1866          | 0.0           |
| 440    | 57273         | 19.1          | 570    | 106526        | 5.2           | 700    | 24589         | 0.0           | 830    | 2282          | 0.0           | 960    | 3110          | 0.0           |
| 445    | 54802         | 21.6          | 575    | 111610        | 3.7           | 705    | 21832         | 0.0           | 835    | 3140          | 0.0           | 965    | 3880          | 0.0           |
| 450    | 39184         | 18.1          | 580    | 117163        | 2.6           | 710    | 19500         | 0.0           | 840    | 2365          | 0.0           | 970    | 3243          | 0.0           |
| 455    | 22506         | 11.8          | 585    | 122201        | 1.8           | 715    | 17870         | 0.0           | 845    | 3024          | 0.0           | 975    | 2014          | 0.0           |
| 460    | 13692         | 8.1           | 590    | 125662        | 1.2           | 720    | 15924         | 0.0           | 850    | 2510          | 0.0           | 980    | 1688          | 0.0           |
| 465    | 9446          | 6.2           | 595    | 127415        | 0.8           | 725    | 14268         | 0.0           | 855    | 2739          | 0.0           | 985    | 2827          | 0.0           |
| 470    | 6698          | 4.8           | 600    | 129155        | 0.5           | 730    | 12438         | 0.0           | 860    | 3515          | 0.0           | 990    | 4172          | 0.0           |
| 475    | 5328          | 4.1           | 605    | 128057        | 0.4           | 735    | 11255         | 0.0           | 865    | 3600          | 0.0           | 995    | 3177          | 0.0           |
| 480    | 5081          | 4.1           | 610    | 126031        | 0.2           | 740    | 9951          | 0.0           | 870    | 3609          | 0.0           | 1000   | 3241          | 0.0           |
| 485    | 5579          | 4.6           | 615    | 123059        | 0.1           | 745    | 8870          | 0.0           | 875    | 3208          | 0.0           |        |               |               |

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Melanopic Flux vs. Wavelength



Melanopic Lumens: 2145.7 M/P: 0.35

| 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    | 2044          | 0.0           | 490    | 7179          | 11.1          | 620    | 118034        | 1.5           | 750    | 8362          | 0.0           | 880    | 3128          | 0.0           |
| 365    | 2016          | 0.0           | 495    | 10476         | 16.9          | 625    | 111884        | 0.9           | 755    | 7635          | 0.0           | 885    | 3110          | 0.0           |
| 370    | 2020          | 0.0           | 500    | 15549         | 26.0          | 630    | 106119        | 0.6           | 760    | 6582          | 0.0           | 890    | 2632          | 0.0           |
| 375    | 2137          | 0.0           | 505    | 22477         | 38.2          | 635    | 99706         | 0.4           | 765    | 5777          | 0.0           | 895    | 2709          | 0.0           |
| 380    | 2046          | 0.0           | 510    | 30417         | 51.6          | 640    | 92142         | 0.2           | 770    | 5474          | 0.0           | 900    | 2016          | 0.0           |
| 385    | 1925          | 0.0           | 515    | 39274         | 65.1          | 645    | 84987         | 0.1           | 775    | 4977          | 0.0           | 905    | 1748          | 0.0           |
| 390    | 1893          | 0.0           | 520    | 47282         | 75.2          | 650    | 78016         | 0.1           | 780    | 4723          | 0.0           | 910    | 2046          | 0.0           |
| 395    | 1695          | 0.0           | 525    | 55413         | 82.9          | 655    | 71541         | 0.1           | 785    | 4219          | 0.0           | 915    | 1844          | 0.0           |
| 400    | 1633          | 0.0           | 530    | 62377         | 86.0          | 660    | 64863         | 0.0           | 790    | 3969          | 0.0           | 920    | 2734          | 0.0           |
| 405    | 2065          | 0.1           | 535    | 68520         | 85.4          | 665    | 58485         | 0.0           | 795    | 4122          | 0.0           | 925    | 2307          | 0.0           |
| 410    | 3449          | 0.2           | 540    | 73435         | 81.1          | 670    | 51641         | 0.0           | 800    | 2864          | 0.0           | 930    | 2039          | 0.0           |
| 415    | 7117          | 0.7           | 545    | 78677         | 75.4          | 675    | 46030         | 0.0           | 805    | 3151          | 0.0           | 935    | 1784          | 0.0           |
| 420    | 13992         | 2.3           | 550    | 83331         | 68.1          | 680    | 40590         | 0.0           | 810    | 3022          | 0.0           | 940    | 2464          | 0.0           |
| 425    | 25176         | 6.2           | 555    | 89120         | 60.9          | 685    | 35691         | 0.0           | 815    | 3471          | 0.0           | 945    | 2794          | 0.0           |
| 430    | 38151         | 13.0          | 560    | 94613         | 52.9          | 690    | 31631         | 0.0           | 820    | 2749          | 0.0           | 950    | 3090          | 0.0           |
| 435    | 49673         | 22.2          | 565    | 99818         | 44.8          | 695    | 27437         | 0.0           | 825    | 2729          | 0.0           | 955    | 1866          | 0.0           |
| 440    | 57273         | 32.0          | 570    | 106526        | 37.6          | 700    | 24589         | 0.0           | 830    | 2282          | 0.0           | 960    | 3110          | 0.0           |
| 445    | 54802         | 36.7          | 575    | 111610        | 30.4          | 705    | 21832         | 0.0           | 835    | 3140          | 0.0           | 965    | 3880          | 0.0           |
| 450    | 39184         | 30.4          | 580    | 117163        | 24.1          | 710    | 19500         | 0.0           | 840    | 2365          | 0.0           | 970    | 3243          | 0.0           |
| 455    | 22506         | 19.7          | 585    | 122201        | 18.7          | 715    | 17870         | 0.0           | 845    | 3024          | 0.0           | 975    | 2014          | 0.0           |
| 460    | 13692         | 13.2          | 590    | 125662        | 14.0          | 720    | 15924         | 0.0           | 850    | 2510          | 0.0           | 980    | 1688          | 0.0           |
| 465    | 9446          | 10.0          | 595    | 127415        | 10.2          | 725    | 14268         | 0.0           | 855    | 2739          | 0.0           | 985    | 2827          | 0.0           |
| 470    | 6698          | 7.7           | 600    | 129155        | 7.3           | 730    | 12438         | 0.0           | 860    | 3515          | 0.0           | 990    | 4172          | 0.0           |
| 475    | 5328          | 6.7           | 605    | 128057        | 5.0           | 735    | 11255         | 0.0           | 865    | 3600          | 0.0           | 995    | 3177          | 0.0           |
| 480    | 5081          | 6.9           | 610    | 126031        | 3.4           | 740    | 9951          | 0.0           | 870    | 3609          | 0.0           | 1000   | 3241          | 0.0           |
| 485    | 5579          | 8.1           | 615    | 123059        | 2.3           | 745    | 8870          | 0.0           | 875    | 3208          | 0.0           |        |               |               |

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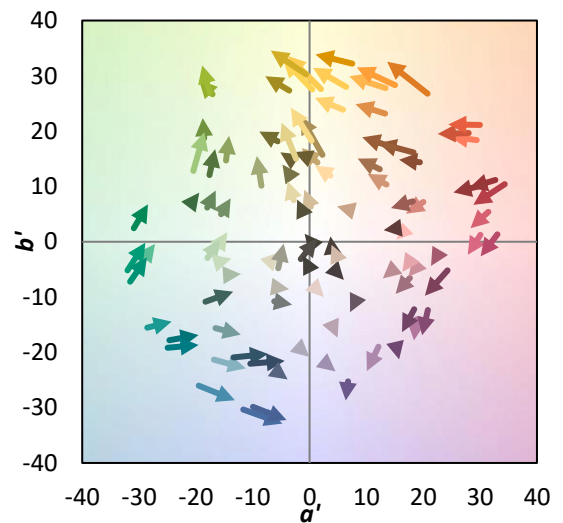
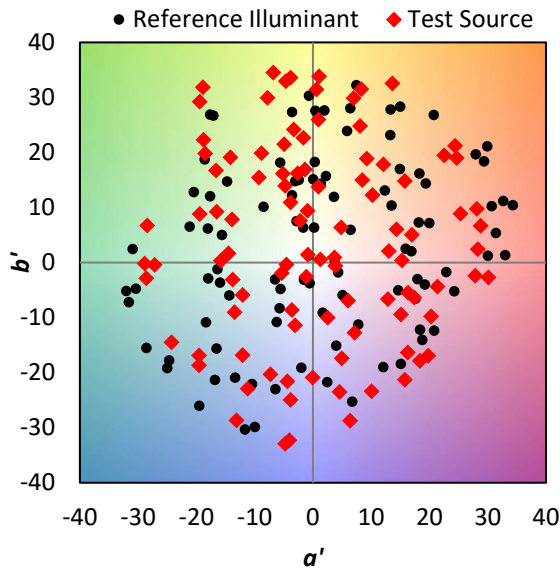
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**Summary**

$R_f = 69.9$   
 $R_g = 98.3$   
CIE  $R_a = 71.5$   
 $R_9 = -16.1$



**Color Vector Graphics**

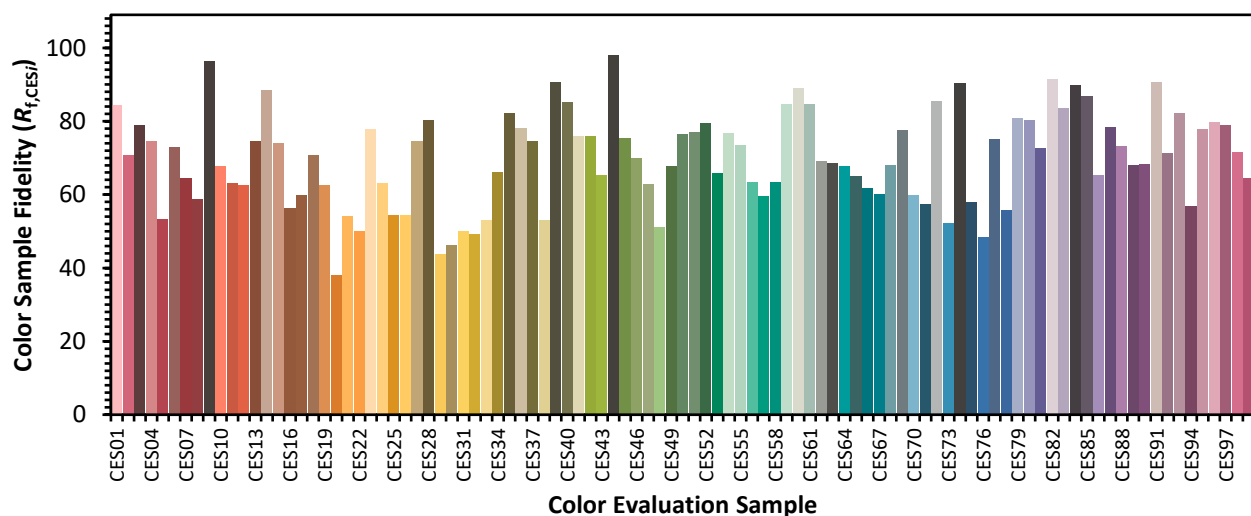


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**Individual Sample Fidelity Index ( $R_{f,i}$ )**

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 54 | CES51 = 77 | CES76 = 48 |
| CES02 = 63 | CES27 = 74 | CES52 = 80 | CES77 = 75 |
| CES03 = 31 | CES28 = 80 | CES53 = 66 | CES78 = 56 |
| CES04 = 71 | CES29 = 44 | CES54 = 77 | CES79 = 81 |
| CES05 = 50 | CES30 = 46 | CES55 = 74 | CES80 = 80 |
| CES06 = 52 | CES31 = 50 | CES56 = 63 | CES81 = 73 |
| CES07 = 42 | CES32 = 49 | CES57 = 60 | CES82 = 91 |
| CES08 = 41 | CES33 = 53 | CES58 = 63 | CES83 = 84 |
| CES09 = 29 | CES34 = 66 | CES59 = 85 | CES84 = 90 |
| CES10 = 77 | CES35 = 82 | CES60 = 89 | CES85 = 87 |
| CES11 = 60 | CES36 = 78 | CES61 = 85 | CES86 = 65 |
| CES12 = 66 | CES37 = 75 | CES62 = 69 | CES87 = 78 |
| CES13 = 43 | CES38 = 53 | CES63 = 68 | CES88 = 73 |
| CES14 = 74 | CES39 = 91 | CES64 = 68 | CES89 = 68 |
| CES15 = 71 | CES40 = 85 | CES65 = 65 | CES90 = 68 |
| CES16 = 48 | CES41 = 76 | CES66 = 62 | CES91 = 91 |
| CES17 = 50 | CES42 = 76 | CES67 = 60 | CES92 = 71 |
| CES18 = 57 | CES43 = 65 | CES68 = 68 | CES93 = 82 |
| CES19 = 73 | CES44 = 98 | CES69 = 77 | CES94 = 57 |
| CES20 = 67 | CES45 = 75 | CES70 = 60 | CES95 = 78 |
| CES21 = 88 | CES46 = 70 | CES71 = 57 | CES96 = 80 |
| CES22 = 80 | CES47 = 63 | CES72 = 86 | CES97 = 79 |
| CES23 = 92 | CES48 = 51 | CES73 = 52 | CES98 = 71 |
| CES24 = 91 | CES49 = 68 | CES74 = 90 | CES99 = 64 |
| CES25 = 73 | CES50 = 77 | CES75 = 58 |            |

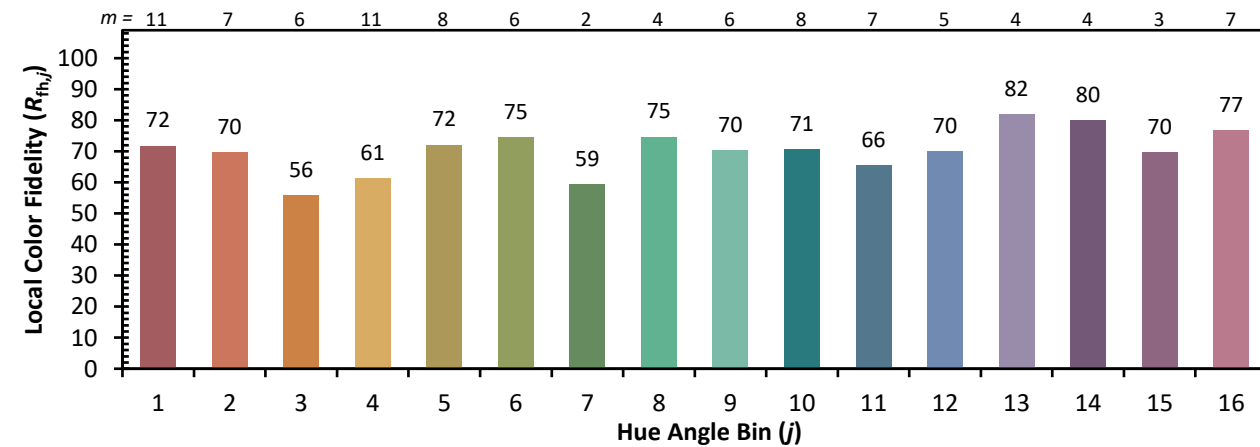
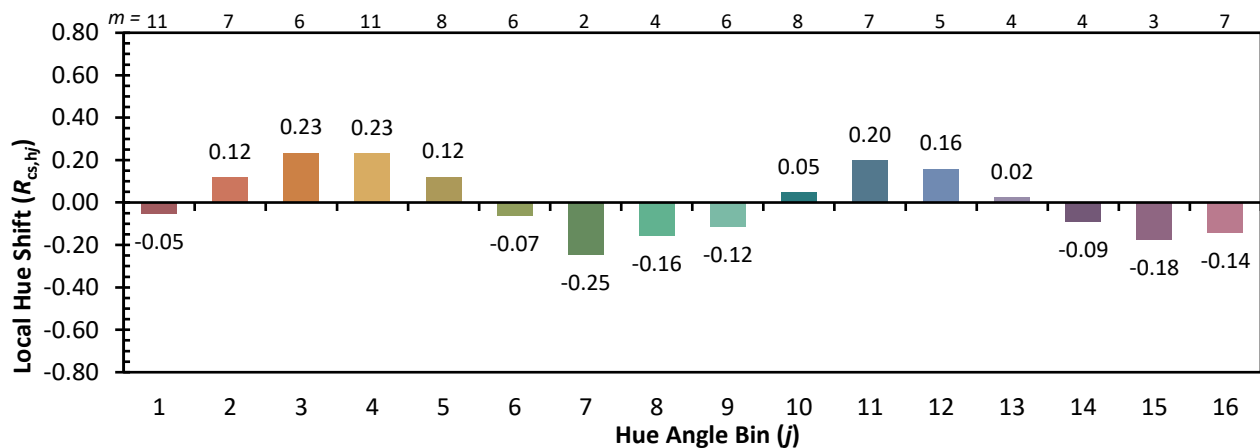
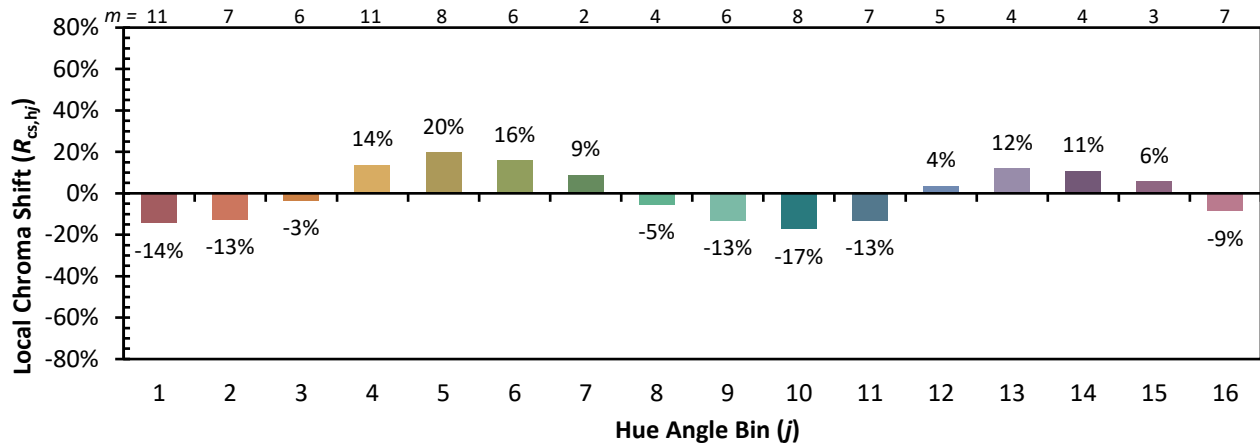




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Color Rendition by Hue-Angle Bin



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Measure Comparisons



(END OF REPORT)