

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: P629198

Luminaire Tested: GWS-SA1B-727-U-T2-W

Issue Date: 1/10/2023

**Test Information**

Test Method: LM-79-2019  
Report Number: P629198  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2209-782-19)  
Test Lab: COOPER LIGHTING SOLUTIONS  
Issue Date: 1/10/2023  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: McGRAW-EDISON  
Catalog Number: GWS-SA1B-727-U-T2-W  
Description: GALLEON WALL SLIM LUMINAIRE. (1) LIGHTSQUARES WITH 16 LEDS EACH AND TYPE II OPTICS  
Light Source: (16) 2700K CCT, 70 CRI LEDS  
Ballast/Driver: -

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 2973.8 lumens  
Efficiency: N/A  
Efficacy: 119.0 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 0.5' x H: 0')  
IES Classification: Type II - Medium  
BUG Rating: B1 - U0 - G1

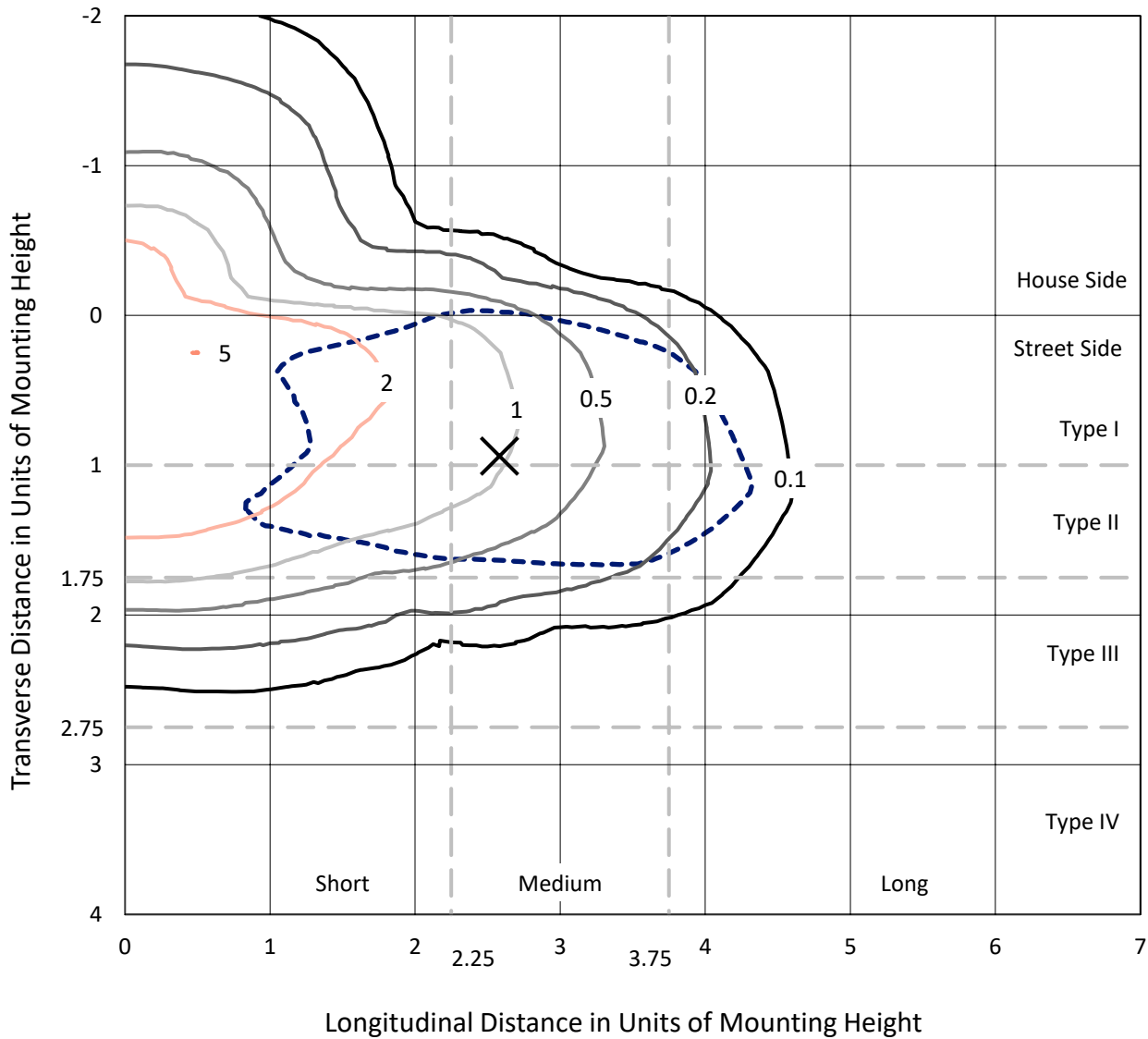
Input Watts (W): 25  
Input Voltage (V): 120  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 0  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 28.75 FT



REPORT NUMBER: P629198  
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### Iso-Footcandle Lines of Horizontal Illumination

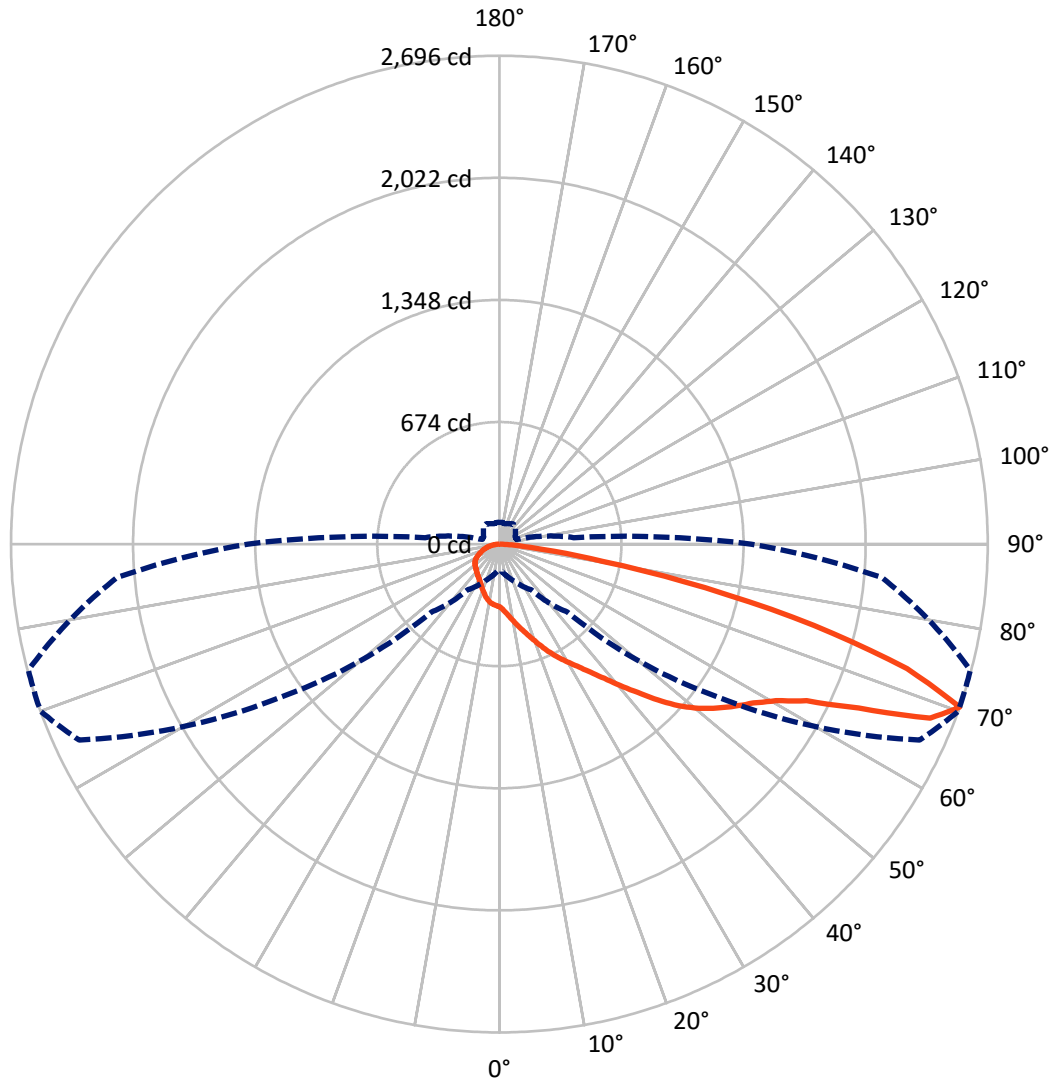
✕ Max cd  
 - - - 1/2 Max cd



Based on 10 foot mounting height. Maximum calculated value = 5 fc  
 Type II - Medium - N/A

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### Luminous Intensity Polar Plot



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

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**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 532.9    | 0.0    | 532.9  |
|                    | % Fixture | 17.9     | 0.0    | 17.9   |
| <b>Street Side</b> | Lumens    | 2440.9   | 0.0    | 2440.9 |
|                    | % Fixture | 82.1     | 0.0    | 82.1   |
| <b>Total</b>       | Lumens    | 2973.8   | 0.0    | 2973.8 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 35.2   | 1.2       |
| 10°-20°   | 114.7  | 3.9       |
| 20°-30°   | 203.1  | 6.8       |
| 30°-40°   | 305.7  | 10.3      |
| 40°-50°   | 462.5  | 15.6      |
| 50°-60°   | 662.6  | 22.3      |
| 60°-70°   | 732.4  | 24.6      |
| 70°-80°   | 413.3  | 13.9      |
| 80°-90°   | 44.2   | 1.5       |
| 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°    | 2973.8 | 100.0     |
| 0°-180°   | 2973.8 | 100.0     |

**Coefficient of Utilization**



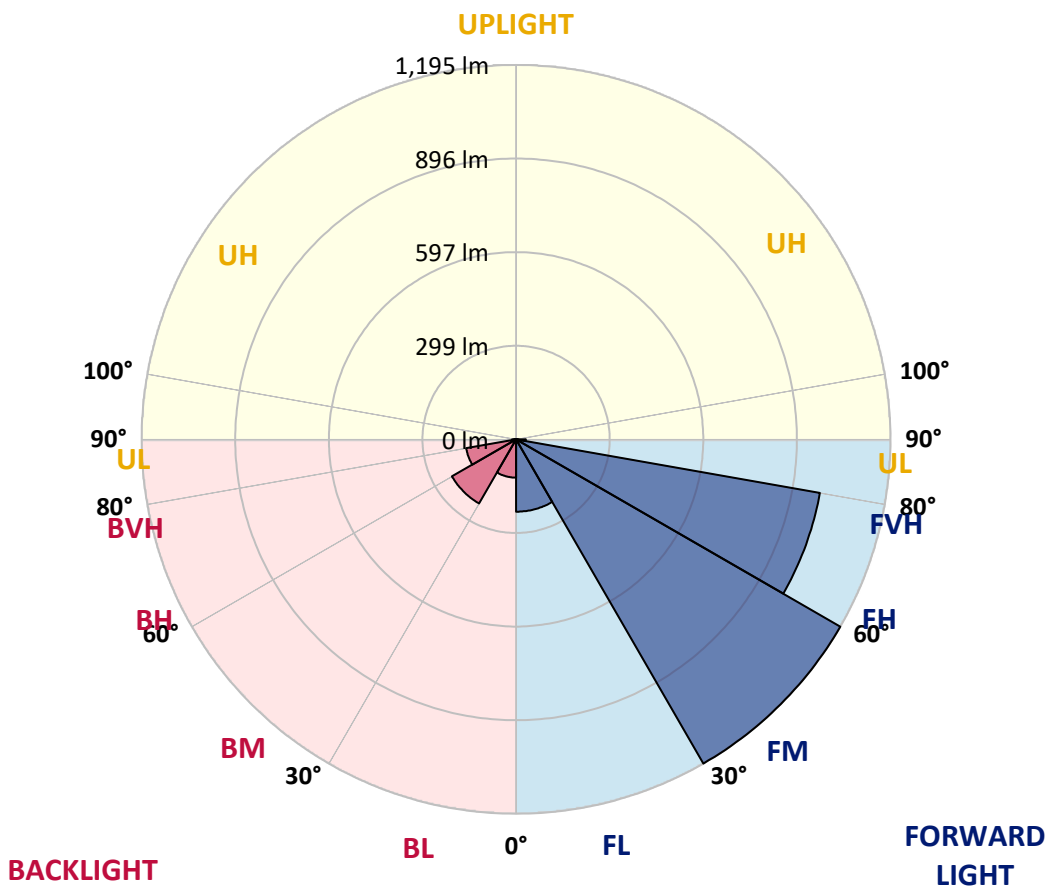
REPORT NUMBER: P629198

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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°)    | 230.9  | 7.8       |                         |      |         |
| FM (30°-60°)   | 1194.6 | 40.2      |                         |      |         |
| FH (60°-80°)   | 984.2  | 33.1      |                         |      | G1/1800 |
| FVH (80°-90°)  | 31.3   | 1.1       |                         |      | G1/100  |
| BL (0°-30°)    | 122.2  | 4.1       | B1/500                  |      |         |
| BM (30°-60°)   | 236.2  | 7.9       | B1/1000                 |      |         |
| BH (60°-80°)   | 161.5  | 5.4       | B1/500                  |      | G1/500  |
| BVH (80°-90°)  | 13.0   | 0.4       |                         |      | G1/100  |
| UL (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B1-U0-G1**  
 Type II Medium





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 CATALOG NUMBER: GWS-SA1B-727-U-T2-W

**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 65°    | 70°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 346.8  | 346.8  | 346.8  | 346.8  | 346.8  | 346.8  | 346.8  | 346.8  | 346.8  | 346.8  | 346.8  |
| 2.5°  | 384.2  | 383.6  | 384.0  | 383.6  | 381.2  | 375.4  | 370.7  | 364.6  | 360.6  | 358.2  | 352.6  |
| 5°    | 429.3  | 428.7  | 427.2  | 425.0  | 420.7  | 412.8  | 401.0  | 387.8  | 379.9  | 373.9  | 362.1  |
| 7.5°  | 461.8  | 461.8  | 461.5  | 459.0  | 456.0  | 447.6  | 433.6  | 416.4  | 404.8  | 394.5  | 375.2  |
| 10°   | 478.3  | 479.4  | 480.9  | 484.5  | 483.9  | 479.4  | 466.3  | 447.8  | 433.2  | 421.2  | 392.4  |
| 12.5° | 487.3  | 488.0  | 490.6  | 498.1  | 505.8  | 506.9  | 499.2  | 479.8  | 463.9  | 447.8  | 411.5  |
| 15°   | 498.9  | 499.2  | 502.6  | 511.6  | 523.0  | 534.4  | 532.5  | 513.1  | 496.8  | 479.0  | 432.8  |
| 17.5° | 508.0  | 509.5  | 515.7  | 526.2  | 540.4  | 556.1  | 565.5  | 553.5  | 533.3  | 512.9  | 456.0  |
| 20°   | 511.2  | 512.3  | 520.4  | 536.5  | 555.9  | 578.0  | 599.1  | 595.8  | 575.4  | 551.4  | 482.2  |
| 22.5° | 522.8  | 522.8  | 528.8  | 542.3  | 565.1  | 597.3  | 631.5  | 639.9  | 621.8  | 593.7  | 510.3  |
| 25°   | 548.4  | 547.5  | 550.3  | 555.9  | 573.1  | 612.8  | 663.5  | 688.7  | 668.5  | 636.9  | 538.5  |
| 27.5° | 583.4  | 583.0  | 582.7  | 583.6  | 589.4  | 626.4  | 690.6  | 734.2  | 714.0  | 678.4  | 563.6  |
| 30°   | 621.4  | 620.1  | 622.9  | 620.3  | 619.1  | 642.5  | 713.6  | 775.1  | 759.4  | 719.4  | 584.5  |
| 32.5° | 673.2  | 670.8  | 670.2  | 661.8  | 656.7  | 667.6  | 732.1  | 821.5  | 809.0  | 763.7  | 607.9  |
| 35°   | 741.5  | 739.4  | 728.4  | 715.1  | 699.8  | 705.0  | 755.1  | 866.8  | 867.7  | 819.1  | 638.6  |
| 37.5° | 810.5  | 810.9  | 802.3  | 771.0  | 755.3  | 752.3  | 790.1  | 922.0  | 940.5  | 885.3  | 678.4  |
| 40°   | 867.9  | 870.5  | 870.5  | 837.4  | 813.9  | 811.1  | 839.3  | 987.6  | 1024.3 | 966.5  | 728.6  |
| 42.5° | 911.5  | 913.9  | 921.4  | 897.5  | 872.8  | 882.5  | 899.0  | 1053.3 | 1119.3 | 1066.8 | 792.2  |
| 45°   | 959.4  | 961.3  | 965.4  | 951.7  | 937.3  | 963.1  | 966.7  | 1132.0 | 1228.0 | 1179.4 | 866.2  |
| 47.5° | 1023.0 | 1021.3 | 1021.7 | 1011.6 | 1000.5 | 1042.1 | 1041.3 | 1198.1 | 1333.1 | 1302.8 | 946.3  |
| 50°   | 1102.1 | 1105.3 | 1102.3 | 1082.3 | 1069.2 | 1107.2 | 1112.2 | 1271.4 | 1425.5 | 1424.8 | 1027.1 |
| 52.5° | 1178.2 | 1179.4 | 1195.3 | 1196.2 | 1169.3 | 1161.4 | 1174.3 | 1345.3 | 1503.5 | 1536.6 | 1104.7 |
| 55°   | 1182.0 | 1187.0 | 1234.7 | 1269.0 | 1312.5 | 1248.6 | 1237.0 | 1415.8 | 1578.9 | 1645.9 | 1185.2 |
| 57.5° | 1099.7 | 1107.7 | 1188.7 | 1262.8 | 1383.6 | 1398.4 | 1344.5 | 1506.9 | 1654.3 | 1753.6 | 1278.5 |
| 60°   | 924.0  | 940.5  | 1050.5 | 1164.0 | 1351.6 | 1506.1 | 1564.3 | 1630.7 | 1753.4 | 1863.6 | 1391.7 |
| 62.5° | 590.0  | 596.5  | 750.8  | 940.7  | 1207.4 | 1495.5 | 1803.7 | 1848.8 | 1904.2 | 2006.9 | 1566.2 |
| 65°   | 295.5  | 316.1  | 406.5  | 561.5  | 870.7  | 1317.8 | 1924.6 | 2248.2 | 2180.3 | 2252.3 | 1849.0 |
| 67.5° | 200.5  | 207.1  | 252.9  | 337.4  | 510.5  | 933.6  | 1849.6 | 2584.7 | 2564.7 | 2576.6 | 2150.5 |
| 70°   | 147.8  | 152.1  | 188.2  | 238.9  | 308.8  | 530.1  | 1472.5 | 2559.4 | 2695.8 | 2691.5 | 2118.9 |
| 72.5° | 107.9  | 110.0  | 137.3  | 182.4  | 228.8  | 274.2  | 899.2  | 2067.5 | 2353.3 | 2477.3 | 1853.1 |
| 75°   | 78.4   | 81.0   | 95.4   | 136.4  | 177.9  | 171.0  | 443.9  | 1493.4 | 1794.6 | 2033.1 | 1509.7 |
| 77.5° | 58.4   | 61.7   | 68.3   | 85.5   | 124.6  | 122.5  | 191.9  | 969.7  | 1160.7 | 1327.9 | 917.1  |
| 80°   | 42.1   | 42.8   | 46.6   | 54.8   | 79.1   | 71.8   | 91.3   | 505.6  | 579.7  | 635.2  | 359.5  |
| 82.5° | 25.6   | 26.2   | 31.2   | 33.7   | 49.0   | 45.1   | 47.5   | 163.7  | 234.6  | 249.0  | 134.3  |
| 85°   | 7.5    | 8.0    | 14.2   | 15.5   | 20.4   | 19.3   | 19.1   | 66.6   | 79.5   | 101.6  | 52.9   |
| 87.5° | 0.0    | 0.0    | 0.0    | 0.0    | 0.2    | 1.3    | 2.4    | 11.8   | 17.8   | 24.7   | 12.9   |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |



REPORT NUMBER: P629198  
 CATALOG NUMBER: GWS-SA1B-727-U-T2-W

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°   | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 346.8  | 346.8 | 346.8 | 346.8 | 346.8 | 346.8 | 346.8 | 346.8 | 346.8 | 346.8 | 346.8 |
| 2.5°  | 350.5  | 345.5 | 342.9 | 338.4 | 335.2 | 332.0 | 328.8 | 325.7 | 324.5 | 322.5 | 323.0 |
| 5°    | 356.7  | 349.0 | 341.2 | 332.4 | 324.9 | 318.7 | 313.1 | 308.1 | 306.0 | 304.0 | 304.9 |
| 7.5°  | 366.1  | 354.5 | 339.7 | 323.6 | 311.8 | 303.2 | 297.4 | 293.9 | 292.9 | 291.4 | 291.4 |
| 10°   | 378.2  | 360.8 | 334.8 | 311.8 | 297.6 | 290.7 | 288.1 | 287.9 | 289.0 | 289.2 | 288.8 |
| 12.5° | 391.5  | 366.8 | 327.5 | 297.8 | 285.8 | 283.6 | 285.6 | 289.2 | 292.9 | 294.8 | 294.4 |
| 15°   | 405.3  | 370.7 | 315.0 | 284.5 | 277.2 | 280.0 | 286.2 | 293.5 | 300.6 | 304.3 | 304.0 |
| 17.5° | 418.1  | 371.5 | 298.9 | 271.6 | 269.7 | 276.8 | 287.5 | 298.9 | 308.6 | 313.7 | 313.9 |
| 20°   | 432.5  | 370.0 | 282.3 | 260.0 | 262.1 | 273.7 | 287.9 | 301.7 | 313.1 | 318.2 | 319.5 |
| 22.5° | 445.6  | 364.9 | 266.2 | 249.0 | 255.7 | 270.1 | 284.5 | 297.4 | 307.5 | 312.4 | 314.1 |
| 25°   | 457.5  | 355.0 | 248.6 | 239.8 | 250.8 | 264.9 | 275.9 | 284.9 | 292.0 | 295.0 | 297.4 |
| 27.5° | 463.9  | 340.1 | 235.3 | 232.5 | 246.0 | 257.6 | 263.7 | 266.4 | 268.8 | 267.9 | 269.7 |
| 30°   | 465.2  | 321.7 | 223.7 | 226.7 | 238.9 | 247.5 | 248.8 | 246.0 | 241.9 | 235.3 | 236.8 |
| 32.5° | 463.9  | 300.4 | 214.0 | 220.5 | 231.0 | 236.1 | 234.4 | 227.1 | 217.2 | 206.9 | 207.6 |
| 35°   | 464.3  | 278.9 | 206.1 | 213.6 | 221.7 | 224.5 | 220.2 | 210.1 | 199.6 | 190.2 | 189.7 |
| 37.5° | 469.1  | 260.9 | 199.4 | 206.9 | 212.7 | 213.2 | 208.4 | 197.9 | 192.5 | 185.4 | 184.6 |
| 40°   | 482.2  | 247.5 | 193.4 | 200.3 | 203.9 | 203.7 | 198.3 | 190.8 | 194.5 | 192.1 | 191.5 |
| 42.5° | 503.7  | 239.4 | 188.4 | 193.2 | 195.8 | 196.2 | 191.9 | 187.2 | 195.1 | 192.1 | 191.0 |
| 45°   | 538.3  | 238.9 | 185.0 | 186.1 | 190.2 | 193.2 | 190.2 | 184.8 | 187.8 | 173.2 | 170.4 |
| 47.5° | 579.3  | 246.2 | 182.4 | 179.8 | 186.9 | 192.3 | 187.6 | 179.0 | 172.8 | 159.4 | 157.5 |
| 50°   | 628.7  | 261.1 | 180.1 | 173.2 | 182.2 | 189.1 | 184.4 | 172.5 | 163.1 | 156.0 | 154.9 |
| 52.5° | 687.4  | 280.6 | 177.1 | 165.7 | 175.1 | 187.4 | 184.4 | 171.9 | 159.4 | 153.0 | 151.9 |
| 55°   | 748.8  | 303.2 | 173.6 | 156.6 | 167.2 | 187.8 | 185.9 | 167.4 | 156.6 | 153.2 | 152.3 |
| 57.5° | 825.1  | 330.3 | 167.4 | 146.1 | 160.1 | 183.9 | 179.8 | 164.8 | 154.7 | 151.9 | 151.1 |
| 60°   | 924.2  | 370.4 | 155.6 | 135.4 | 151.9 | 177.1 | 174.5 | 160.5 | 149.6 | 147.2 | 146.5 |
| 62.5° | 1081.0 | 438.6 | 141.2 | 125.1 | 142.2 | 162.7 | 166.5 | 152.3 | 143.1 | 142.9 | 142.7 |
| 65°   | 1336.7 | 520.4 | 124.2 | 115.8 | 132.1 | 150.8 | 156.0 | 144.0 | 136.4 | 138.8 | 138.6 |
| 67.5° | 1515.9 | 527.5 | 110.2 | 106.1 | 120.3 | 137.9 | 145.5 | 135.4 | 127.2 | 131.7 | 131.5 |
| 70°   | 1388.5 | 411.5 | 98.2  | 96.0  | 107.7 | 124.0 | 134.1 | 124.6 | 116.5 | 120.8 | 119.9 |
| 72.5° | 1171.1 | 315.4 | 86.8  | 85.5  | 94.8  | 109.4 | 119.5 | 113.9 | 105.3 | 105.3 | 103.4 |
| 75°   | 941.1  | 260.2 | 74.8  | 74.1  | 80.4  | 94.5  | 105.9 | 96.5  | 88.5  | 88.1  | 86.8  |
| 77.5° | 539.8  | 170.6 | 62.7  | 62.3  | 64.2  | 79.1  | 82.3  | 80.4  | 74.3  | 71.6  | 70.7  |
| 80°   | 215.1  | 88.7  | 49.4  | 46.6  | 48.6  | 58.0  | 64.9  | 61.7  | 56.5  | 53.1  | 51.1  |
| 82.5° | 83.4   | 44.5  | 34.8  | 30.5  | 33.3  | 41.9  | 47.1  | 46.0  | 42.5  | 34.8  | 32.7  |
| 85°   | 34.0   | 21.7  | 20.8  | 17.6  | 19.3  | 22.6  | 27.1  | 23.4  | 19.3  | 13.8  | 13.1  |
| 87.5° | 9.0    | 8.0   | 7.7   | 4.7   | 3.7   | 1.1   | 0.2   | 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   |



Signify Classified - Internal  
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: SP1-1908-441-1-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

|           |      |      |       |
|-----------|------|------|-------|
| 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 |      |       |

Rf: 69.9  
 Rg: 98.3



**Test Conditions**

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

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| 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: SP1-1908-441-1-R4

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**

| $\lambda$ (nm) | Power ( $\mu\text{W}/\text{nm}$ ) | Lumens ( $\phi/\text{nm}$ ) | $\lambda$ (nm) | Power ( $\mu\text{W}/\text{nm}$ ) | Lumens ( $\phi/\text{nm}$ ) | $\lambda$ (nm) | Power ( $\mu\text{W}/\text{nm}$ ) | Lumens ( $\phi/\text{nm}$ ) | $\lambda$ (nm) | Power ( $\mu\text{W}/\text{nm}$ ) | Lumens ( $\phi/\text{nm}$ ) | $\lambda$ (nm) | Power ( $\mu\text{W}/\text{nm}$ ) | Lumens ( $\phi/\text{nm}$ ) |
|----------------|-----------------------------------|-----------------------------|----------------|-----------------------------------|-----------------------------|----------------|-----------------------------------|-----------------------------|----------------|-----------------------------------|-----------------------------|----------------|-----------------------------------|-----------------------------|
| 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

| $\lambda$ (nm) | Power ( $\mu\text{W}/\text{nm}$ ) | Lumens ( $\phi/\text{nm}$ ) | $\lambda$ (nm) | Power ( $\mu\text{W}/\text{nm}$ ) | Lumens ( $\phi/\text{nm}$ ) | $\lambda$ (nm) | Power ( $\mu\text{W}/\text{nm}$ ) | Lumens ( $\phi/\text{nm}$ ) | $\lambda$ (nm) | Power ( $\mu\text{W}/\text{nm}$ ) | Lumens ( $\phi/\text{nm}$ ) | $\lambda$ (nm) | Power ( $\mu\text{W}/\text{nm}$ ) | Lumens ( $\phi/\text{nm}$ ) |
|----------------|-----------------------------------|-----------------------------|----------------|-----------------------------------|-----------------------------|----------------|-----------------------------------|-----------------------------|----------------|-----------------------------------|-----------------------------|----------------|-----------------------------------|-----------------------------|
| 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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**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 ( $R_{f,i}$ )**

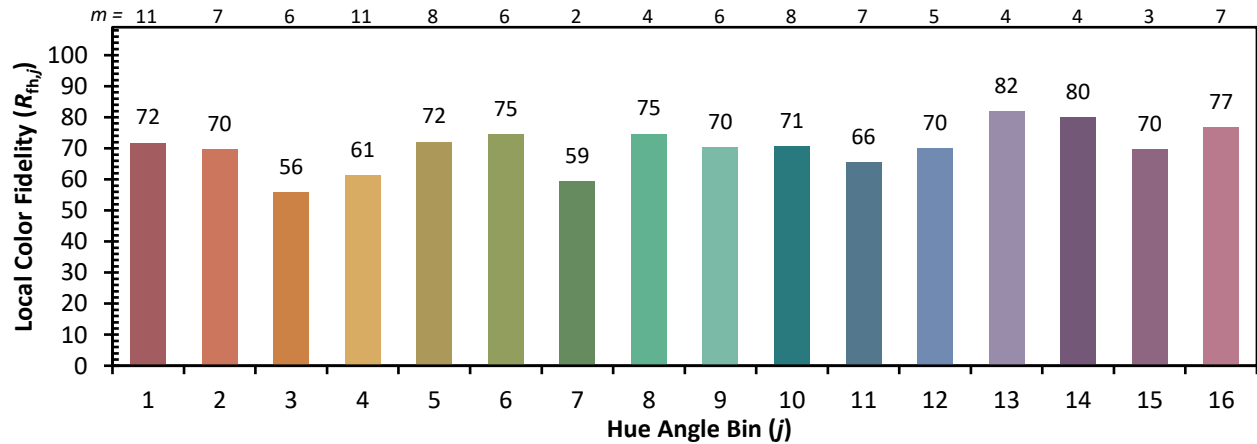
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 54 | CES51 = 77 | CES76 = 48 |
| CES02 = 63 | CES27 = 74 | CES52 = 80 | CES77 = 75 |
| CES03 = 31 | CES28 = 80 | CES53 = 66 | CES78 = 56 |
| CES04 = 71 | CES29 = 44 | CES54 = 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)