

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: P631206

Luminaire Tested: GWS-SA1F-730-U-RW-W-GRSBK

Issue Date: 1/10/2023

**Test Information**

Test Method: LM-79-2019  
Report Number: P631206  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2209-782-50)  
Test Lab: COOPER LIGHTING SOLUTIONS  
Issue Date: 1/10/2023  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: McGRAW-EDISON  
Catalog Number: GWS-SA1F-730-U-RW-W-GRSBK  
Description: GALLEON WALL SLIM LUMINAIRE. (1) LIGHTSQUARES WITH 16 LEDS EACH AND RECTANGULAR WIDE OPTICS W/ FACTORY INSTALLED GLARE SHIELD, BK  
Light Source: (16) 3000K CCT, 70 CRI LEDS  
Ballast/Driver: -

**Summary**

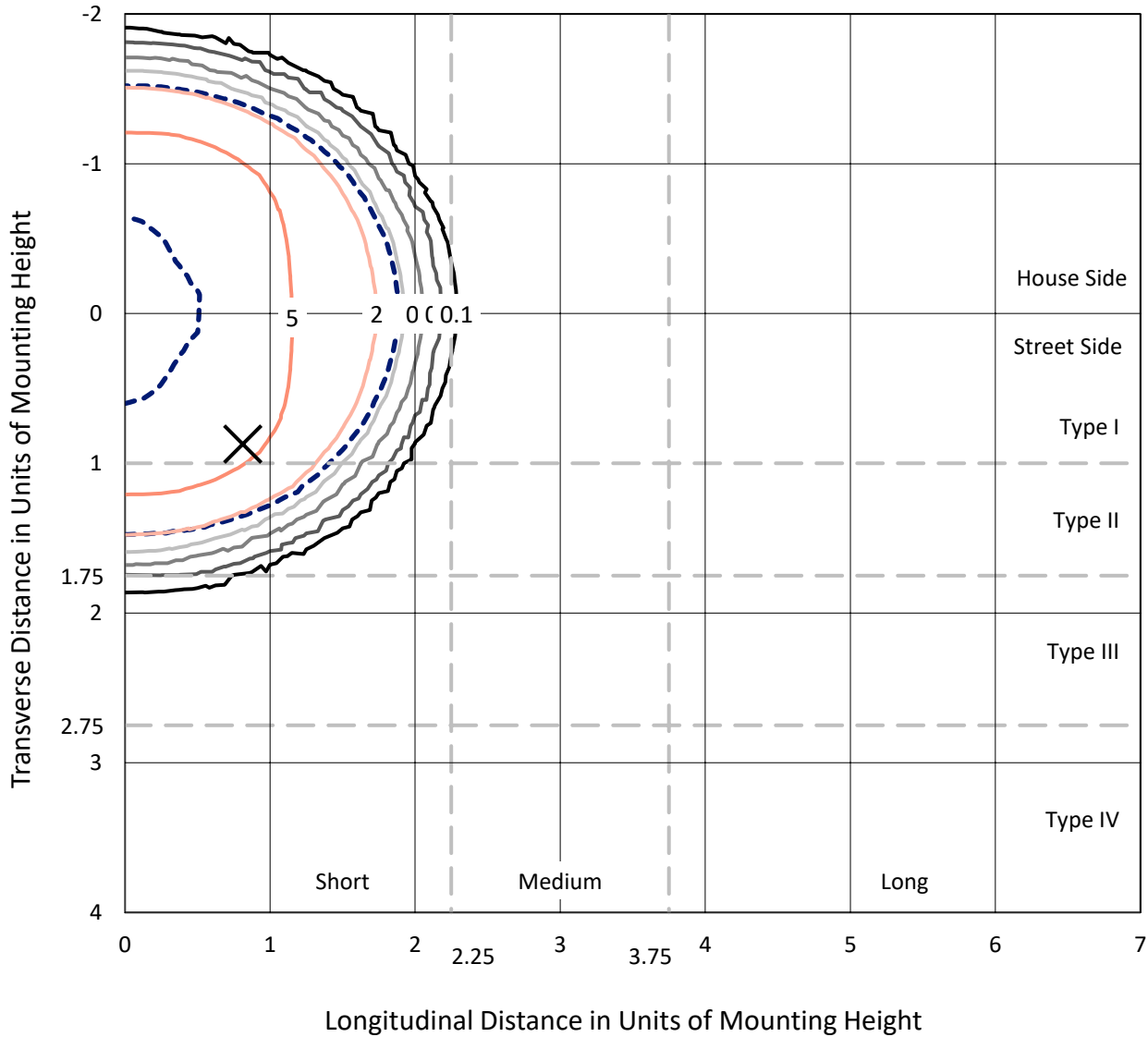
Lumens per Lamp: N/A  
Luminaire Lumens: 4972.3 lumens  
Efficiency: N/A  
Efficacy: 74.0 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 0.5' x H: 0')  
IES Classification: Type V - Short  
BUG Rating: B2 - U0 - G0  
  
Input Watts (W): 67.2  
Input Voltage (V): 120  
Input Current (Ain): NR  
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



REPORT NUMBER: P631206  
 CATALOG NUMBER: GWS-SA1F-730-U-RW-W-GRSBK

### Iso-Footcandle Lines of Horizontal Illumination

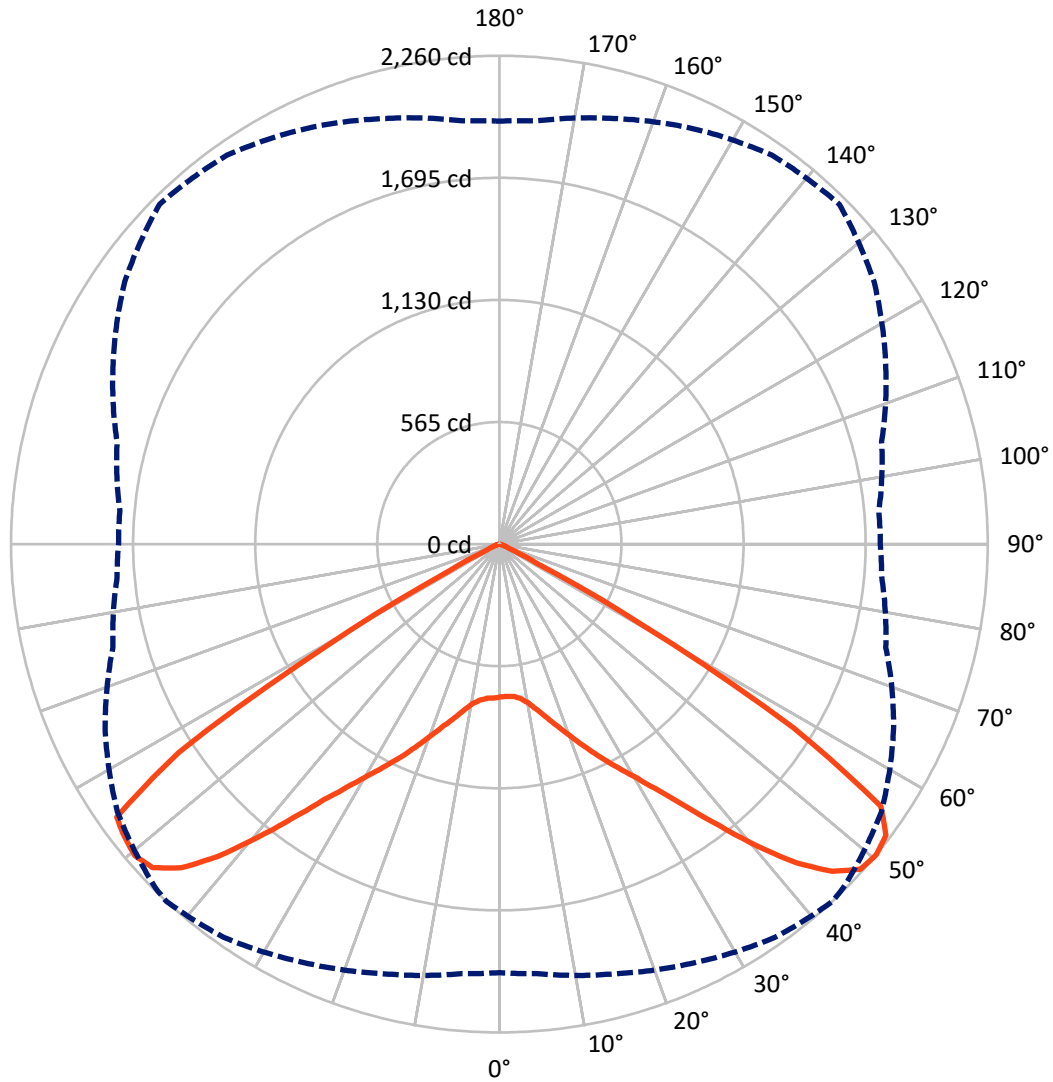
✕ Max cd  
 - - - 1/2 Max cd



Based on 10 foot mounting height. Maximum calculated value = 8.5 fc  
 Type V - Short - N/A

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### Luminous Intensity Polar Plot



— Vertical Plane Through 43-Deg Lateral    - - - Horizontal Cone Through 50-Deg Vertical

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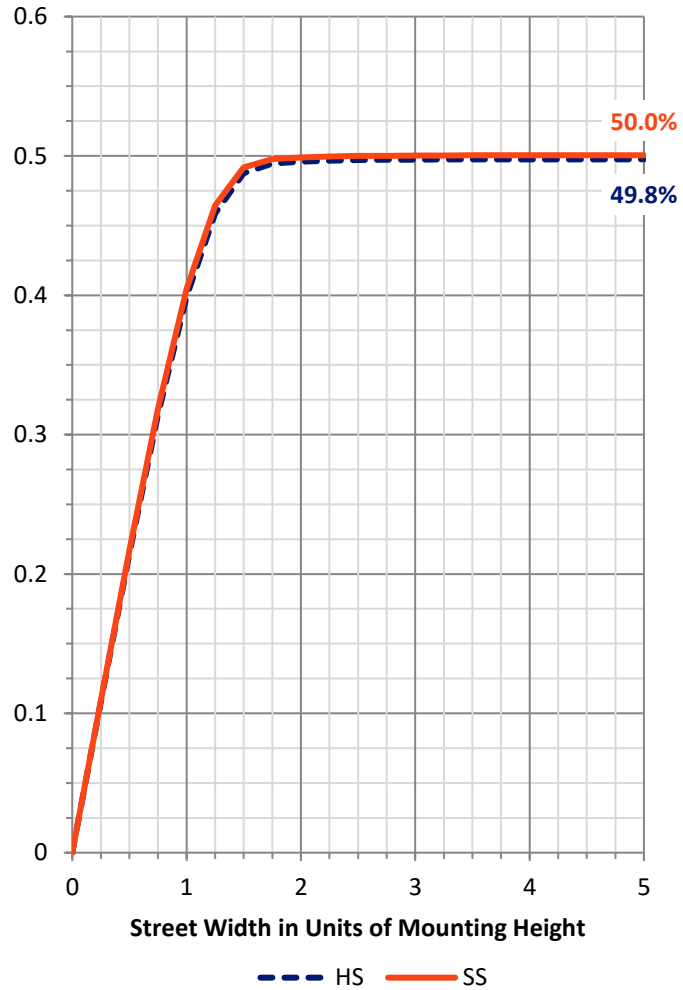
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 2486.1   | 0.0    | 2486.1 |
|                    | % Fixture | 50.0     | 0.0    | 50.0   |
| <b>Street Side</b> | Lumens    | 2486.2   | 0.0    | 2486.2 |
|                    | % Fixture | 50.0     | 0.0    | 50.0   |
| <b>Total</b>       | Lumens    | 4972.3   | 0.0    | 4972.3 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 69.6   | 1.4       |
| 10°-20°   | 239.7  | 4.8       |
| 20°-30°   | 484.9  | 9.8       |
| 30°-40°   | 899.6  | 18.1      |
| 40°-50°   | 1493.4 | 30.0      |
| 50°-60°   | 1524.0 | 30.7      |
| 60°-70°   | 249.9  | 5.0       |
| 70°-80°   | 10.9   | 0.2       |
| 80°-90°   | 0.1    | 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°    | 4972.3 | 100.0     |
| 0°-180°   | 4972.3 | 100.0     |

**Coefficient of Utilization**



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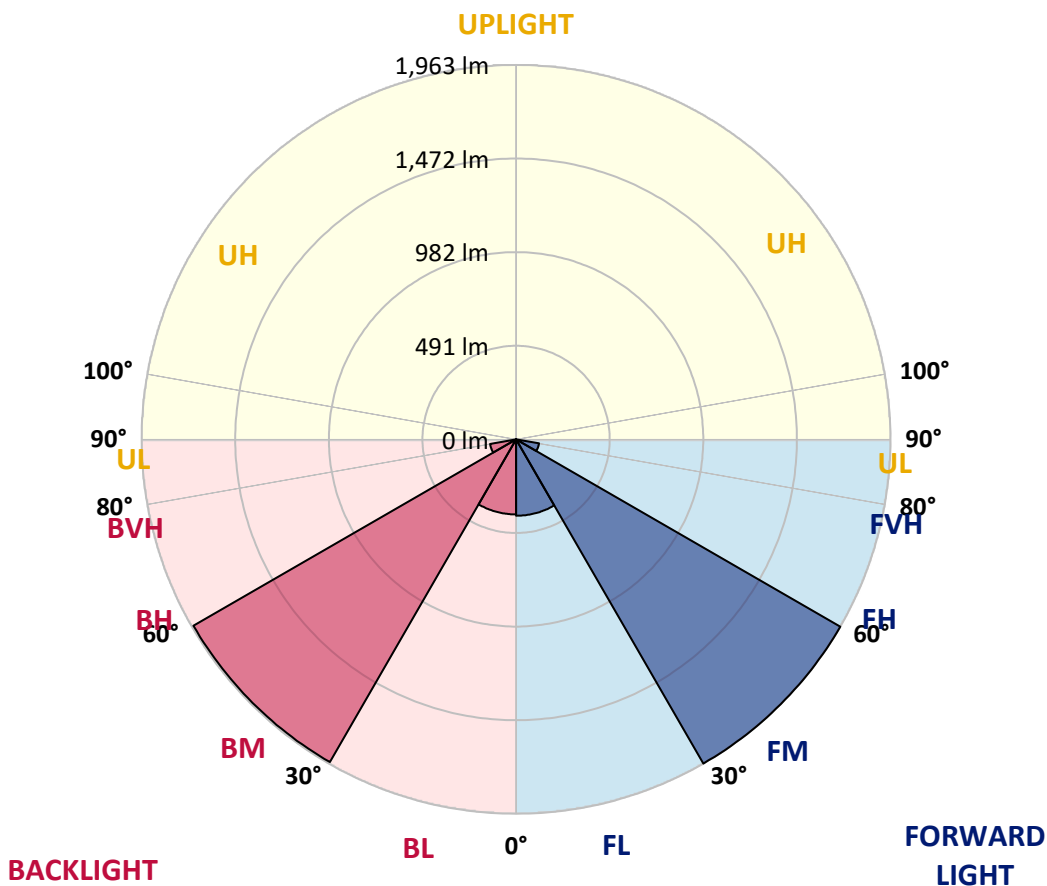
CATALOG NUMBER: GWS-SA1F-730-U-RW-W-GRSBK

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

| Zone           | Lumens | % Fixture | Zone Rating/Lumen Limit |      |        |
|----------------|--------|-----------|-------------------------|------|--------|
|                |        |           | B                       | U    | G      |
| FL (0°-30°)    | 400.6  | 8.1       |                         |      |        |
| FM (30°-60°)   | 1963.3 | 39.5      |                         |      |        |
| FH (60°-80°)   | 122.2  | 2.5       |                         |      | G0/660 |
| FVH (80°-90°)  | 0.0    | 0.0       |                         |      | G0/10  |
| BL (0°-30°)    | 393.6  | 7.9       | B1/500                  |      |        |
| BM (30°-60°)   | 1953.8 | 39.3      | B2/2500                 |      |        |
| BH (60°-80°)   | 138.6  | 2.8       | B1/500                  |      | G0/660 |
| BVH (80°-90°)  | 0.1    | 0.0       |                         |      | G0/10  |
| UL (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |        |
| UH (100°-180°) | 0.0    | 0.0       |                         | U0/0 |        |

**BUG Rating: B2-U0-G0**

Type V Short





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CATALOG NUMBER: GWS-SA1F-730-U-RW-W-GRSBK

**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 43°    | 45°    | 55°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 707.2  | 707.2  | 707.2  | 707.2  | 707.2  | 707.2  | 707.2  | 707.2  | 707.2  | 707.2  | 707.2  |
| 2.5°  | 694.0  | 695.7  | 697.9  | 700.1  | 702.8  | 705.6  | 707.2  | 712.2  | 711.1  | 715.5  | 715.5  |
| 5°    | 686.3  | 688.0  | 690.7  | 695.7  | 701.7  | 707.8  | 712.2  | 722.1  | 727.6  | 736.4  | 739.7  |
| 7.5°  | 690.2  | 692.4  | 695.7  | 703.4  | 712.7  | 722.1  | 727.0  | 743.0  | 754.0  | 770.5  | 779.8  |
| 10°   | 702.8  | 705.0  | 710.5  | 723.7  | 735.8  | 749.0  | 755.1  | 775.4  | 793.0  | 815.6  | 828.8  |
| 12.5° | 717.1  | 719.9  | 730.9  | 750.7  | 771.6  | 789.2  | 797.4  | 820.0  | 838.1  | 863.4  | 884.3  |
| 15°   | 732.0  | 736.4  | 753.4  | 782.6  | 812.3  | 835.9  | 844.7  | 868.9  | 887.1  | 914.0  | 937.7  |
| 17.5° | 766.6  | 771.6  | 790.8  | 822.2  | 862.9  | 890.4  | 898.1  | 923.4  | 937.1  | 955.3  | 980.0  |
| 20°   | 810.1  | 819.4  | 843.1  | 881.0  | 925.6  | 952.0  | 957.5  | 982.2  | 981.1  | 988.8  | 1010.3 |
| 22.5° | 864.0  | 870.6  | 896.4  | 941.5  | 991.6  | 1020.7 | 1033.3 | 1043.8 | 1030.0 | 1023.5 | 1037.2 |
| 25°   | 920.1  | 927.8  | 955.8  | 1005.3 | 1061.4 | 1094.9 | 1105.4 | 1113.6 | 1091.6 | 1066.9 | 1068.5 |
| 27.5° | 992.7  | 998.2  | 1025.6 | 1078.4 | 1134.5 | 1172.5 | 1181.8 | 1196.1 | 1167.0 | 1127.4 | 1116.4 |
| 30°   | 1079.0 | 1084.5 | 1113.6 | 1169.2 | 1224.7 | 1257.2 | 1271.5 | 1289.1 | 1257.2 | 1207.7 | 1195.0 |
| 32.5° | 1180.2 | 1185.7 | 1223.1 | 1280.3 | 1325.9 | 1361.1 | 1374.9 | 1393.6 | 1368.3 | 1312.7 | 1298.4 |
| 35°   | 1301.2 | 1304.5 | 1348.5 | 1410.6 | 1459.0 | 1493.1 | 1502.5 | 1524.5 | 1496.4 | 1440.9 | 1433.2 |
| 37.5° | 1441.4 | 1445.3 | 1493.1 | 1565.1 | 1614.6 | 1652.6 | 1667.4 | 1673.5 | 1639.4 | 1577.2 | 1571.2 |
| 40°   | 1595.4 | 1608.0 | 1654.8 | 1732.3 | 1787.9 | 1835.7 | 1848.9 | 1828.6 | 1780.7 | 1696.0 | 1685.0 |
| 42.5° | 1756.0 | 1767.0 | 1819.2 | 1903.4 | 1967.7 | 2016.7 | 2017.2 | 1973.2 | 1891.8 | 1774.7 | 1758.2 |
| 45°   | 1889.6 | 1894.0 | 1961.7 | 2046.4 | 2125.5 | 2160.2 | 2163.5 | 2083.7 | 1961.1 | 1820.3 | 1785.1 |
| 47.5° | 1981.5 | 1988.6 | 2047.5 | 2128.8 | 2216.3 | 2247.6 | 2241.0 | 2141.5 | 1994.1 | 1850.0 | 1791.7 |
| 50°   | 1982.6 | 1994.7 | 2058.4 | 2137.1 | 2221.8 | 2259.7 | 2250.4 | 2158.0 | 2012.8 | 1851.1 | 1775.8 |
| 52.5° | 1807.1 | 1826.9 | 1930.9 | 2044.7 | 2174.5 | 2239.4 | 2241.6 | 2179.4 | 2005.7 | 1833.5 | 1761.5 |
| 55°   | 1363.3 | 1384.8 | 1515.7 | 1709.8 | 1960.6 | 2141.5 | 2172.8 | 2154.1 | 1997.4 | 1841.2 | 1786.8 |
| 57.5° | 721.5  | 705.0  | 777.6  | 970.1  | 1285.2 | 1605.3 | 1697.1 | 1846.7 | 1905.6 | 1850.6 | 1833.5 |
| 60°   | 157.3  | 167.7  | 223.3  | 300.8  | 501.6  | 755.1  | 844.7  | 1101.0 | 1405.7 | 1540.9 | 1638.8 |
| 62.5° | 67.6   | 66.5   | 69.3   | 78.6   | 114.9  | 191.4  | 233.7  | 381.7  | 602.2  | 827.1  | 979.5  |
| 65°   | 55.5   | 56.1   | 58.3   | 58.3   | 54.4   | 55.0   | 57.7   | 87.4   | 140.8  | 197.4  | 265.1  |
| 67.5° | 41.8   | 42.3   | 46.2   | 47.3   | 44.5   | 39.6   | 39.0   | 33.0   | 34.6   | 43.4   | 45.1   |
| 70°   | 26.4   | 26.4   | 28.6   | 29.7   | 29.7   | 27.5   | 26.9   | 23.6   | 23.1   | 26.4   | 29.7   |
| 72.5° | 14.3   | 14.3   | 15.4   | 15.9   | 15.4   | 14.8   | 14.8   | 14.3   | 13.7   | 15.9   | 20.3   |
| 75°   | 6.0    | 6.0    | 6.6    | 6.6    | 6.0    | 6.0    | 6.0    | 6.0    | 6.0    | 7.1    | 11.0   |
| 77.5° | 1.1    | 1.6    | 2.2    | 1.6    | 1.1    | 1.1    | 1.1    | 1.6    | 1.6    | 2.2    | 3.3    |
| 80°   | 0.5    | 0.5    | 1.1    | 0.5    | 0.0    | 0.0    | 0.0    | 0.0    | 0.5    | 0.5    | 0.5    |
| 82.5° | 0.5    | 0.5    | 0.5    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.5    |
| 85°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 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    |



REPORT NUMBER: P631206

CATALOG NUMBER: GWS-SA1F-730-U-RW-W-GRSBK

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 707.2  | 707.2  | 707.2  | 707.2  | 707.2  | 707.2  | 707.2  | 707.2  | 707.2  | 707.2  | 707.2  |
| 2.5°  | 719.3  | 713.3  | 715.5  | 716.6  | 714.9  | 713.8  | 707.8  | 706.1  | 703.4  | 699.0  | 697.9  |
| 5°    | 743.5  | 738.6  | 738.0  | 734.7  | 727.0  | 717.7  | 706.1  | 701.2  | 695.7  | 690.2  | 689.1  |
| 7.5°  | 784.2  | 778.2  | 774.3  | 763.3  | 745.7  | 730.9  | 711.6  | 701.2  | 694.0  | 686.9  | 685.2  |
| 10°   | 836.5  | 829.3  | 818.3  | 798.0  | 774.3  | 752.9  | 730.3  | 716.6  | 705.6  | 695.7  | 695.1  |
| 12.5° | 892.0  | 884.3  | 864.5  | 838.7  | 810.1  | 790.3  | 761.7  | 742.4  | 725.9  | 711.1  | 709.4  |
| 15°   | 950.3  | 941.0  | 914.0  | 883.2  | 856.8  | 836.5  | 805.1  | 774.3  | 749.0  | 727.6  | 725.4  |
| 17.5° | 994.9  | 983.3  | 951.4  | 928.3  | 906.9  | 886.0  | 850.8  | 810.1  | 776.5  | 750.7  | 744.6  |
| 20°   | 1022.9 | 1011.9 | 981.7  | 969.0  | 959.1  | 944.3  | 902.5  | 860.1  | 822.7  | 790.8  | 785.3  |
| 22.5° | 1049.8 | 1036.6 | 1010.3 | 1010.3 | 1018.0 | 1011.9 | 966.8  | 918.4  | 874.4  | 837.6  | 829.3  |
| 25°   | 1080.1 | 1069.6 | 1050.9 | 1066.3 | 1085.6 | 1085.0 | 1038.8 | 978.4  | 927.8  | 886.5  | 878.3  |
| 27.5° | 1124.1 | 1113.6 | 1107.0 | 1136.2 | 1160.4 | 1158.7 | 1108.1 | 1042.7 | 989.4  | 948.7  | 941.0  |
| 30°   | 1201.6 | 1191.7 | 1184.6 | 1219.8 | 1250.6 | 1239.0 | 1183.5 | 1120.2 | 1066.3 | 1020.2 | 1014.7 |
| 32.5° | 1305.0 | 1294.6 | 1285.2 | 1320.4 | 1347.9 | 1333.1 | 1280.3 | 1220.9 | 1158.7 | 1113.6 | 1102.6 |
| 35°   | 1440.9 | 1418.9 | 1409.5 | 1451.3 | 1462.9 | 1446.4 | 1395.8 | 1343.5 | 1277.5 | 1225.8 | 1218.7 |
| 37.5° | 1581.1 | 1555.2 | 1548.6 | 1584.9 | 1603.6 | 1597.6 | 1538.2 | 1483.8 | 1412.3 | 1355.1 | 1346.8 |
| 40°   | 1701.0 | 1677.3 | 1665.8 | 1722.4 | 1764.8 | 1768.6 | 1715.3 | 1648.7 | 1564.6 | 1505.2 | 1490.4 |
| 42.5° | 1771.4 | 1751.0 | 1748.3 | 1836.3 | 1905.6 | 1955.1 | 1891.3 | 1822.5 | 1734.0 | 1666.9 | 1654.8 |
| 45°   | 1787.3 | 1774.1 | 1797.2 | 1912.7 | 2020.5 | 2110.7 | 2056.2 | 1983.7 | 1888.0 | 1817.0 | 1805.5 |
| 47.5° | 1785.7 | 1781.3 | 1822.5 | 1952.3 | 2088.7 | 2199.8 | 2172.8 | 2090.9 | 1998.5 | 1924.3 | 1913.3 |
| 50°   | 1762.0 | 1762.6 | 1831.3 | 1972.1 | 2116.2 | 2224.0 | 2197.0 | 2121.1 | 2038.7 | 1965.5 | 1956.7 |
| 52.5° | 1752.7 | 1749.4 | 1814.8 | 1966.1 | 2144.2 | 2213.0 | 2152.5 | 2067.2 | 1975.4 | 1885.2 | 1872.0 |
| 55°   | 1785.7 | 1777.4 | 1817.0 | 1961.1 | 2147.5 | 2206.9 | 2047.5 | 1862.7 | 1674.6 | 1567.9 | 1559.1 |
| 57.5° | 1835.2 | 1826.4 | 1845.1 | 1924.8 | 1975.4 | 1835.2 | 1506.9 | 1208.8 | 1015.2 | 933.3  | 897.5  |
| 60°   | 1638.8 | 1632.8 | 1618.5 | 1522.3 | 1305.6 | 985.0  | 670.9  | 427.9  | 307.4  | 248.6  | 248.6  |
| 62.5° | 1016.9 | 1008.6 | 931.1  | 691.8  | 502.7  | 290.9  | 160.0  | 100.1  | 75.9   | 70.9   | 70.4   |
| 65°   | 285.4  | 283.8  | 234.8  | 166.1  | 105.6  | 65.4   | 57.7   | 58.8   | 57.7   | 56.1   | 55.5   |
| 67.5° | 42.9   | 47.3   | 47.3   | 38.5   | 36.8   | 41.2   | 48.4   | 51.7   | 48.9   | 46.2   | 45.1   |
| 70°   | 27.5   | 29.7   | 28.6   | 24.7   | 26.4   | 30.8   | 34.6   | 35.2   | 33.5   | 30.8   | 30.2   |
| 72.5° | 19.2   | 21.4   | 17.6   | 15.9   | 16.5   | 18.1   | 19.8   | 19.8   | 19.2   | 18.1   | 17.0   |
| 75°   | 11.5   | 11.5   | 8.2    | 7.7    | 7.7    | 8.2    | 8.2    | 9.3    | 9.3    | 8.8    | 8.2    |
| 77.5° | 3.8    | 4.4    | 2.7    | 2.2    | 2.2    | 2.2    | 2.7    | 3.3    | 3.3    | 2.7    | 2.2    |
| 80°   | 0.5    | 1.1    | 0.5    | 0.5    | 0.5    | 0.5    | 0.5    | 0.5    | 1.1    | 1.1    | 0.5    |
| 82.5° | 0.5    | 0.5    | 0.5    | 0.0    | 0.0    | 0.0    | 0.0    | 0.5    | 0.5    | 0.5    | 0.5    |
| 85°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.5    | 0.5    |
| 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    |



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: SP1-1908-441-2-R4

Test Date: 10/03/2019

Luminaire Tested: SA1C-730-U-5WQ

Data in this report applies to families of products SA1C-730-U-5WQ .

**Test Information**

Test Method: LM-79-2008  
 Report Number: SP1-1908-441-2-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-730-U-5WQ**  
 Description: McGRAW EDISON ROADWAY AND AREA LUMINAIRE

\*\*\*THIS IS A REVISION OF SP1-1908-441-2-R3. TO UPDATE THE CATALOG INFORMATION.\*\*\*TESTED IN SITU. (1) 70 CRI, 3000K, 1050MA LIGHTSQUARE WITH 16 LEDS AND TYPE V WIDE OPTICS.

**Spectral Parameters**

|                           |        |           |      |      |       |
|---------------------------|--------|-----------|------|------|-------|
| CCT (K):                  | 2993   | CRI (Ra): | 71.8 | R9:  | -38.3 |
| CIE u':                   | 0.2508 | R1:       | 67.5 | R10: | 62.5  |
| CIE v':                   | 0.5215 | R2:       | 82.9 | R11: | 63.7  |
| Duv:                      | 0.0000 | R3:       | 94.7 | R12: | 57.8  |
| CIE x:                    | 0.4374 | R4:       | 67.7 | R13: | 70.4  |
| CIE y:                    | 0.4043 | R5:       | 67.9 | R14: | 97.3  |
| CIE z:                    | 0.1583 | R6:       | 77.6 |      |       |
| Peak Wavelength (nm):     | 593    | R7:       | 76.0 |      |       |
| Dominant Wavelength (nm): | 582    | R8:       | 40.5 |      |       |
| Purity:                   | 53     |           |      |      |       |
| Rf:                       | 75.7   |           |      |      |       |
| Rg:                       | 93.9   |           |      |      |       |



**Test Conditions**

Stabilization Time: 53M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 25.0./44%  
 Sphere Temperature (°C): 25.7

REPORT NUMBER: SP1-1908-441-2-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 3000K 4-step quadrangle

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**Photopic Flux vs. Wavelength**



#####

| 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    | 2397          | NR            | 490    | 24908         | NR            | 620    | 118784        | NR            | 750    | 5037          | NR            | 880    | 2677          | NR            |
| 365    | 2084          | NR            | 495    | 30998         | NR            | 625    | 108951        | NR            | 755    | 4413          | NR            | 885    | 2940          | NR            |
| 370    | 2143          | NR            | 500    | 37103         | NR            | 630    | 99573         | NR            | 760    | 4189          | NR            | 890    | 3116          | NR            |
| 375    | 2413          | NR            | 505    | 42987         | NR            | 635    | 90444         | NR            | 765    | 3677          | NR            | 895    | 3345          | NR            |
| 380    | 2172          | NR            | 510    | 48702         | NR            | 640    | 80749         | NR            | 770    | 3366          | NR            | 900    | 2312          | NR            |
| 385    | 1997          | NR            | 515    | 53741         | NR            | 645    | 71664         | NR            | 775    | 3211          | NR            | 905    | 2829          | NR            |
| 390    | 1830          | NR            | 520    | 57283         | NR            | 650    | 63936         | NR            | 780    | 2682          | NR            | 910    | 2783          | NR            |
| 395    | 1861          | NR            | 525    | 61876         | NR            | 655    | 56611         | NR            | 785    | 2804          | NR            | 915    | 2662          | NR            |
| 400    | 1717          | NR            | 530    | 65398         | NR            | 660    | 49763         | NR            | 790    | 2581          | NR            | 920    | 3047          | NR            |
| 405    | 1761          | NR            | 535    | 69597         | NR            | 665    | 42891         | NR            | 795    | 2711          | NR            | 925    | 2256          | NR            |
| 410    | 2680          | NR            | 540    | 74214         | NR            | 670    | 36939         | NR            | 800    | 2609          | NR            | 930    | 2976          | NR            |
| 415    | 4374          | NR            | 545    | 79911         | NR            | 675    | 31946         | NR            | 805    | 2581          | NR            | 935    | 3503          | NR            |
| 420    | 8071          | NR            | 550    | 86153         | NR            | 680    | 27385         | NR            | 810    | 2404          | NR            | 940    | 4226          | NR            |
| 425    | 15169         | NR            | 555    | 93952         | NR            | 685    | 23504         | NR            | 815    | 2556          | NR            | 945    | 2930          | NR            |
| 430    | 26038         | NR            | 560    | 102904        | NR            | 690    | 20210         | NR            | 820    | 2742          | NR            | 950    | 2115          | NR            |
| 435    | 41316         | NR            | 565    | 112009        | NR            | 695    | 17459         | NR            | 825    | 2014          | NR            | 955    | 2634          | NR            |
| 440    | 59674         | NR            | 570    | 121662        | NR            | 700    | 15207         | NR            | 830    | 2488          | NR            | 960    | 4200          | NR            |
| 445    | 72751         | NR            | 575    | 130476        | NR            | 705    | 13322         | NR            | 835    | 2625          | NR            | 965    | 1982          | NR            |
| 450    | 65091         | NR            | 580    | 137926        | NR            | 710    | 11676         | NR            | 840    | 2754          | NR            | 970    | 3613          | NR            |
| 455    | 44894         | NR            | 585    | 143406        | NR            | 715    | 10626         | NR            | 845    | 2708          | NR            | 975    | 4034          | NR            |
| 460    | 32712         | NR            | 590    | 147039        | NR            | 720    | 9416          | NR            | 850    | 2608          | NR            | 980    | 3922          | NR            |
| 465    | 25296         | NR            | 595    | 147365        | NR            | 725    | 8333          | NR            | 855    | 2605          | NR            | 985    | 1909          | NR            |
| 470    | 19318         | NR            | 600    | 145800        | NR            | 730    | 7134          | NR            | 860    | 1765          | NR            | 990    | 3617          | NR            |
| 475    | 17265         | NR            | 605    | 141363        | NR            | 735    | 6437          | NR            | 865    | 2581          | NR            | 995    | 4767          | NR            |
| 480    | 18260         | NR            | 610    | 134199        | NR            | 740    | 5834          | NR            | 870    | 3016          | NR            | 1000   | 2528          | NR            |
| 485    | 20845         | NR            | 615    | 127683        | NR            | 745    | 5500          | NR            | 875    | 3952          | NR            |        |               |               |

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Scotopic Flux vs. Wavelength



Scotopic Lumens: 8494.8

S/P: 1.23

| 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    | 2397          | NR            | 490    | 24908         | NR            | 620    | 118784        | NR            | 750    | 5037          | NR            | 880    | 2677          | NR            |
| 365    | 2084          | NR            | 495    | 30998         | NR            | 625    | 108951        | NR            | 755    | 4413          | NR            | 885    | 2940          | NR            |
| 370    | 2143          | NR            | 500    | 37103         | NR            | 630    | 99573         | NR            | 760    | 4189          | NR            | 890    | 3116          | NR            |
| 375    | 2413          | NR            | 505    | 42987         | NR            | 635    | 90444         | NR            | 765    | 3677          | NR            | 895    | 3345          | NR            |
| 380    | 2172          | NR            | 510    | 48702         | NR            | 640    | 80749         | NR            | 770    | 3366          | NR            | 900    | 2312          | NR            |
| 385    | 1997          | NR            | 515    | 53741         | NR            | 645    | 71664         | NR            | 775    | 3211          | NR            | 905    | 2829          | NR            |
| 390    | 1830          | NR            | 520    | 57283         | NR            | 650    | 63936         | NR            | 780    | 2682          | NR            | 910    | 2783          | NR            |
| 395    | 1861          | NR            | 525    | 61876         | NR            | 655    | 56611         | NR            | 785    | 2804          | NR            | 915    | 2662          | NR            |
| 400    | 1717          | NR            | 530    | 65398         | NR            | 660    | 49763         | NR            | 790    | 2581          | NR            | 920    | 3047          | NR            |
| 405    | 1761          | NR            | 535    | 69597         | NR            | 665    | 42891         | NR            | 795    | 2711          | NR            | 925    | 2256          | NR            |
| 410    | 2680          | NR            | 540    | 74214         | NR            | 670    | 36939         | NR            | 800    | 2609          | NR            | 930    | 2976          | NR            |
| 415    | 4374          | NR            | 545    | 79911         | NR            | 675    | 31946         | NR            | 805    | 2581          | NR            | 935    | 3503          | NR            |
| 420    | 8071          | NR            | 550    | 86153         | NR            | 680    | 27385         | NR            | 810    | 2404          | NR            | 940    | 4226          | NR            |
| 425    | 15169         | NR            | 555    | 93952         | NR            | 685    | 23504         | NR            | 815    | 2556          | NR            | 945    | 2930          | NR            |
| 430    | 26038         | NR            | 560    | 102904        | NR            | 690    | 20210         | NR            | 820    | 2742          | NR            | 950    | 2115          | NR            |
| 435    | 41316         | NR            | 565    | 112009        | NR            | 695    | 17459         | NR            | 825    | 2014          | NR            | 955    | 2634          | NR            |
| 440    | 59674         | NR            | 570    | 121662        | NR            | 700    | 15207         | NR            | 830    | 2488          | NR            | 960    | 4200          | NR            |
| 445    | 72751         | NR            | 575    | 130476        | NR            | 705    | 13322         | NR            | 835    | 2625          | NR            | 965    | 1982          | NR            |
| 450    | 65091         | NR            | 580    | 137926        | NR            | 710    | 11676         | NR            | 840    | 2754          | NR            | 970    | 3613          | NR            |
| 455    | 44894         | NR            | 585    | 143406        | NR            | 715    | 10626         | NR            | 845    | 2708          | NR            | 975    | 4034          | NR            |
| 460    | 32712         | NR            | 590    | 147039        | NR            | 720    | 9416          | NR            | 850    | 2608          | NR            | 980    | 3922          | NR            |
| 465    | 25296         | NR            | 595    | 147365        | NR            | 725    | 8333          | NR            | 855    | 2605          | NR            | 985    | 1909          | NR            |
| 470    | 19318         | NR            | 600    | 145800        | NR            | 730    | 7134          | NR            | 860    | 1765          | NR            | 990    | 3617          | NR            |
| 475    | 17265         | NR            | 605    | 141363        | NR            | 735    | 6437          | NR            | 865    | 2581          | NR            | 995    | 4767          | NR            |
| 480    | 18260         | NR            | 610    | 134199        | NR            | 740    | 5834          | NR            | 870    | 3016          | NR            | 1000   | 2528          | NR            |
| 485    | 20845         | NR            | 615    | 127683        | NR            | 745    | 5500          | NR            | 875    | 3952          | NR            |        |               |               |

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Melanopic Flux vs. Wavelength



Melanopic Lumens: 3101.5 M/P: 0.45

| 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    | 2397          | NR            | 490    | 24908         | NR            | 620    | 118784        | NR            | 750    | 5037          | NR            | 880    | 2677          | NR            |
| 365    | 2084          | NR            | 495    | 30998         | NR            | 625    | 108951        | NR            | 755    | 4413          | NR            | 885    | 2940          | NR            |
| 370    | 2143          | NR            | 500    | 37103         | NR            | 630    | 99573         | NR            | 760    | 4189          | NR            | 890    | 3116          | NR            |
| 375    | 2413          | NR            | 505    | 42987         | NR            | 635    | 90444         | NR            | 765    | 3677          | NR            | 895    | 3345          | NR            |
| 380    | 2172          | NR            | 510    | 48702         | NR            | 640    | 80749         | NR            | 770    | 3366          | NR            | 900    | 2312          | NR            |
| 385    | 1997          | NR            | 515    | 53741         | NR            | 645    | 71664         | NR            | 775    | 3211          | NR            | 905    | 2829          | NR            |
| 390    | 1830          | NR            | 520    | 57283         | NR            | 650    | 63936         | NR            | 780    | 2682          | NR            | 910    | 2783          | NR            |
| 395    | 1861          | NR            | 525    | 61876         | NR            | 655    | 56611         | NR            | 785    | 2804          | NR            | 915    | 2662          | NR            |
| 400    | 1717          | NR            | 530    | 65398         | NR            | 660    | 49763         | NR            | 790    | 2581          | NR            | 920    | 3047          | NR            |
| 405    | 1761          | NR            | 535    | 69597         | NR            | 665    | 42891         | NR            | 795    | 2711          | NR            | 925    | 2256          | NR            |
| 410    | 2680          | NR            | 540    | 74214         | NR            | 670    | 36939         | NR            | 800    | 2609          | NR            | 930    | 2976          | NR            |
| 415    | 4374          | NR            | 545    | 79911         | NR            | 675    | 31946         | NR            | 805    | 2581          | NR            | 935    | 3503          | NR            |
| 420    | 8071          | NR            | 550    | 86153         | NR            | 680    | 27385         | NR            | 810    | 2404          | NR            | 940    | 4226          | NR            |
| 425    | 15169         | NR            | 555    | 93952         | NR            | 685    | 23504         | NR            | 815    | 2556          | NR            | 945    | 2930          | NR            |
| 430    | 26038         | NR            | 560    | 102904        | NR            | 690    | 20210         | NR            | 820    | 2742          | NR            | 950    | 2115          | NR            |
| 435    | 41316         | NR            | 565    | 112009        | NR            | 695    | 17459         | NR            | 825    | 2014          | NR            | 955    | 2634          | NR            |
| 440    | 59674         | NR            | 570    | 121662        | NR            | 700    | 15207         | NR            | 830    | 2488          | NR            | 960    | 4200          | NR            |
| 445    | 72751         | NR            | 575    | 130476        | NR            | 705    | 13322         | NR            | 835    | 2625          | NR            | 965    | 1982          | NR            |
| 450    | 65091         | NR            | 580    | 137926        | NR            | 710    | 11676         | NR            | 840    | 2754          | NR            | 970    | 3613          | NR            |
| 455    | 44894         | NR            | 585    | 143406        | NR            | 715    | 10626         | NR            | 845    | 2708          | NR            | 975    | 4034          | NR            |
| 460    | 32712         | NR            | 590    | 147039        | NR            | 720    | 9416          | NR            | 850    | 2608          | NR            | 980    | 3922          | NR            |
| 465    | 25296         | NR            | 595    | 147365        | NR            | 725    | 8333          | NR            | 855    | 2605          | NR            | 985    | 1909          | NR            |
| 470    | 19318         | NR            | 600    | 145800        | NR            | 730    | 7134          | NR            | 860    | 1765          | NR            | 990    | 3617          | NR            |
| 475    | 17265         | NR            | 605    | 141363        | NR            | 735    | 6437          | NR            | 865    | 2581          | NR            | 995    | 4767          | NR            |
| 480    | 18260         | NR            | 610    | 134199        | NR            | 740    | 5834          | NR            | 870    | 3016          | NR            | 1000   | 2528          | NR            |
| 485    | 20845         | NR            | 615    | 127683        | NR            | 745    | 5500          | NR            | 875    | 3952          | NR            |        |               |               |

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**Summary**

$R_f = 75.7$   
 $R_g = 93.9$   
 CIE  $R_a = 71.8$   
 $R_9 = -38.3$



**Color Vector Graphics**





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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 67 | CES51 = 87 | CES76 = 63 |
| CES02 = 63 | CES27 = 88 | CES52 = 86 | CES77 = 80 |
| CES03 = 31 | CES28 = 87 | CES53 = 78 | CES78 = 67 |
| CES04 = 71 | CES29 = 66 | CES54 = 84 | CES79 = 87 |
| CES05 = 49 | CES30 = 73 | CES55 = 84 | CES80 = 86 |
| CES06 = 51 | CES31 = 70 | CES56 = 75 | CES81 = 71 |
| CES07 = 41 | CES32 = 65 | CES57 = 74 | CES82 = 94 |
| CES08 = 40 | CES33 = 73 | CES58 = 76 | CES83 = 90 |
| CES09 = 29 | CES34 = 79 | CES59 = 85 | CES84 = 89 |
| CES10 = 76 | CES35 = 89 | CES60 = 93 | CES85 = 77 |
| CES11 = 59 | CES36 = 97 | CES61 = 84 | CES86 = 61 |
| CES12 = 65 | CES37 = 87 | CES62 = 91 | CES87 = 78 |
| CES13 = 43 | CES38 = 81 | CES63 = 77 | CES88 = 77 |
| CES14 = 74 | CES39 = 95 | CES64 = 72 | CES89 = 67 |
| CES15 = 71 | CES40 = 92 | CES65 = 68 | CES90 = 76 |
| CES16 = 47 | CES41 = 88 | CES66 = 69 | CES91 = 89 |
| CES17 = 50 | CES42 = 89 | CES67 = 67 | CES92 = 58 |
| CES18 = 56 | CES43 = 79 | CES68 = 72 | CES93 = 74 |
| CES19 = 73 | CES44 = 99 | CES69 = 81 | CES94 = 49 |
| CES20 = 66 | CES45 = 85 | CES70 = 66 | CES95 = 68 |
| CES21 = 87 | CES46 = 80 | CES71 = 67 | CES96 = 76 |
| CES22 = 79 | CES47 = 82 | CES72 = 88 | CES97 = 82 |
| CES23 = 92 | CES48 = 69 | CES73 = 59 | CES98 = 75 |
| CES24 = 91 | CES49 = 80 | CES74 = 95 | CES99 = 62 |
| CES25 = 73 | CES50 = 87 | CES75 = 69 |            |



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Color Rendition by Hue-Angle Bin



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Measure Comparisons



(END OF REPORT)