

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: P632007

Luminaire Tested: GWS-SA2B-827-U-T3-W-GRSWH

Issue Date: 1/10/2023

Test Information

Test Method: LM-79-2019
Report Number: P632007
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2209-782-25)
Test Lab: COOPER LIGHTING SOLUTIONS
Issue Date: 1/10/2023
Manufacturer: COOPER LIGHTING SOLUTIONS
Product Line: McGRAW-EDISON
Catalog Number: GWS-SA2B-827-U-T3-W-GRSWH
Description: GALLEON WALL SLIM LUMINAIRE. (2) LIGHTSQUARES WITH 16 LEDS EACH AND TYPE III OPTICS W/ FACTORY INSTALLED GLARE SHIELD, WH
Light Source: (32) 2700K CCT, 80 CRI LEDS
Ballast/Driver: -

Summary

Lumens per Lamp: N/A
Luminaire Lumens: 4330 lumens
Efficiency: N/A
Efficacy: 93.3 lumens/watt
Luminous Opening: Rectangular (W 1' x L: 0.5' x H: 0')
IES Classification: Type II - Short
BUG Rating: B1 - U0 - G1

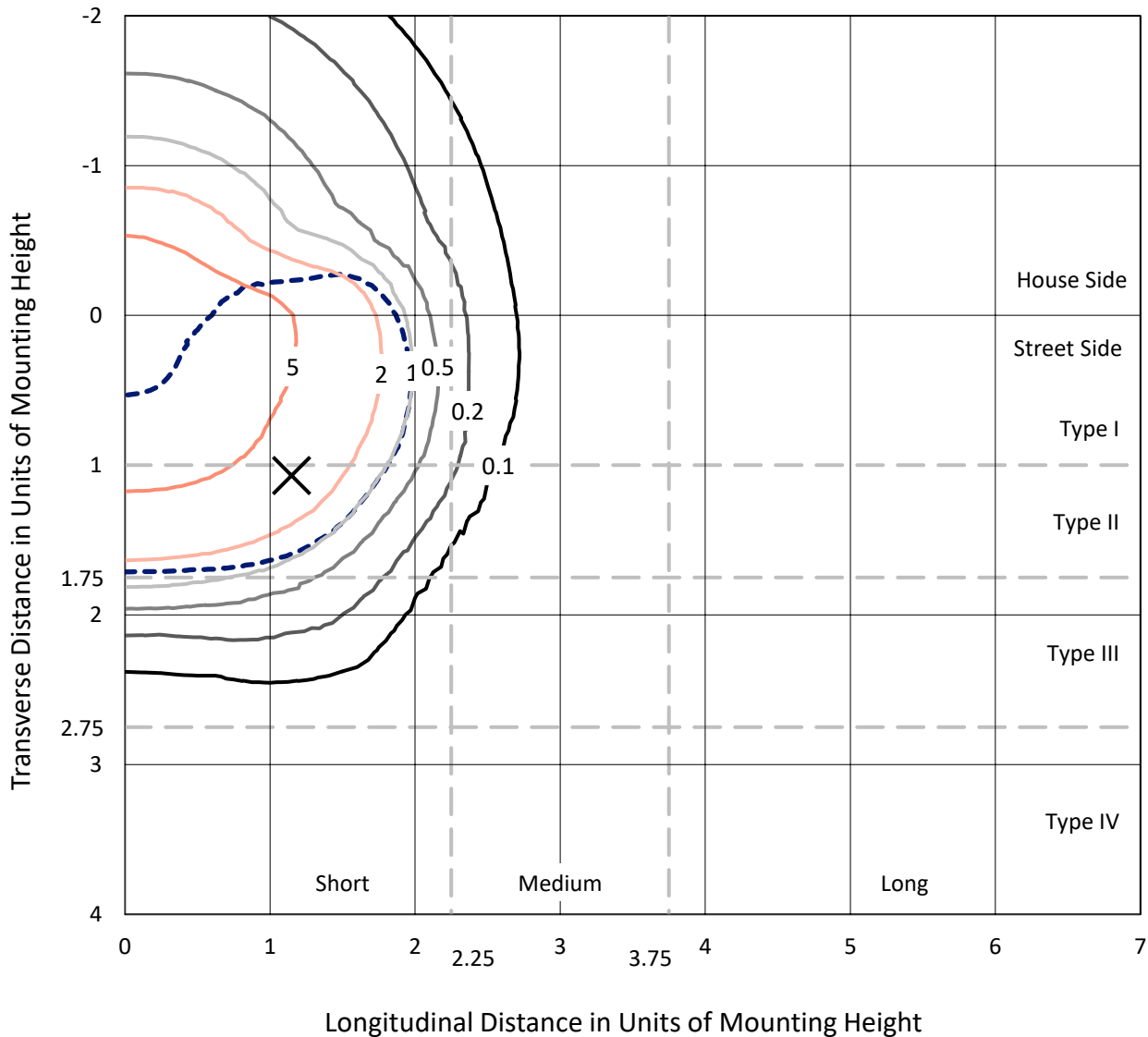
Input Watts (W): 46.4
Input Voltage (V): 120
Input Current (Ain): NR
Voltage Rise (V): NR
Power Factor: NR
Total Harmonic Distortion (THDi): NR
Frequency (hertz): 0
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 28.75 FT



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Iso-Footcandle Lines of Horizontal Illumination

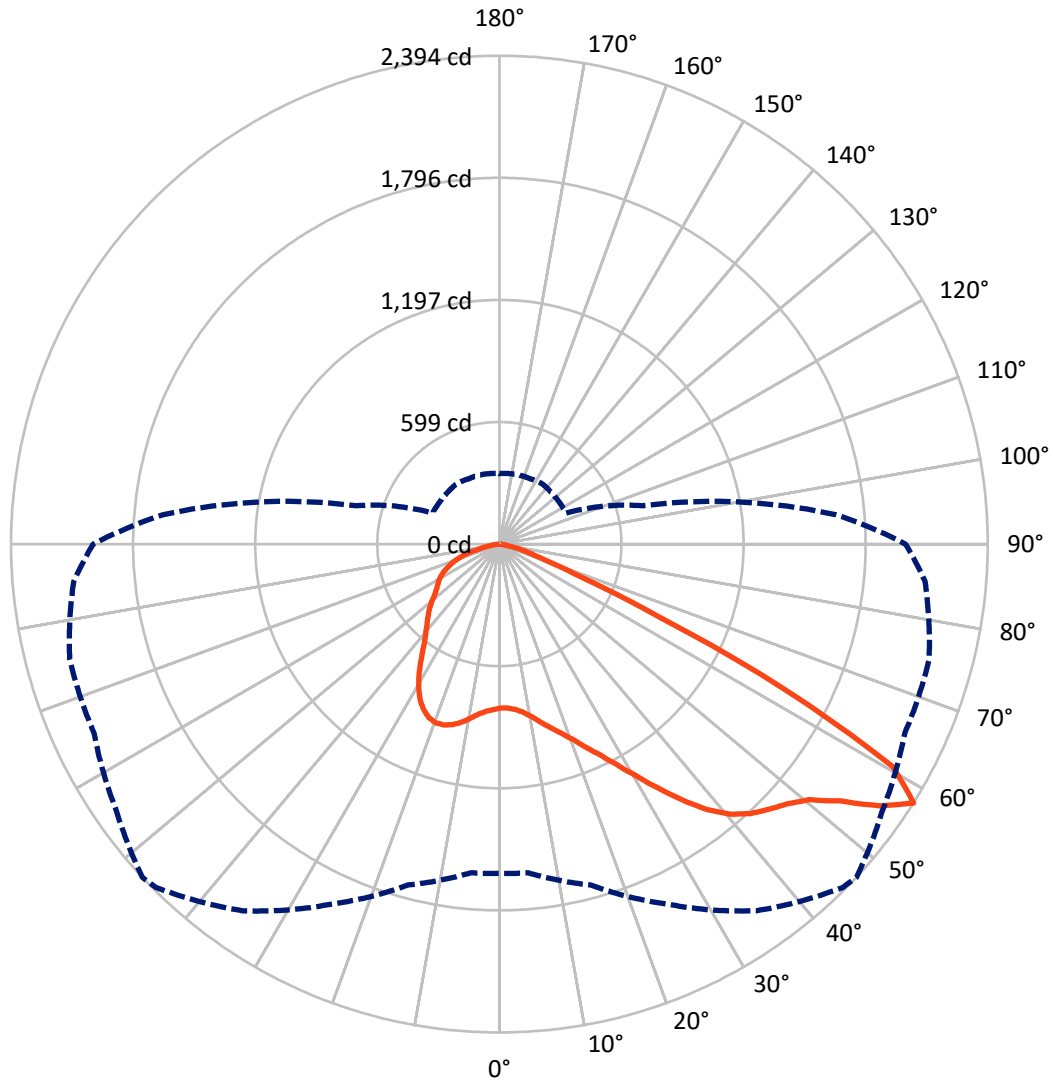
✕ Max cd
 - - - 1/2 Max cd



Based on 10 foot mounting height. Maximum calculated value = 9 fc
 Type II - Short - N/A

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Luminous Intensity Polar Plot



— Vertical Plane Through 47-Deg Lateral - - - Horizontal Cone Through 57.5-Deg Vertical

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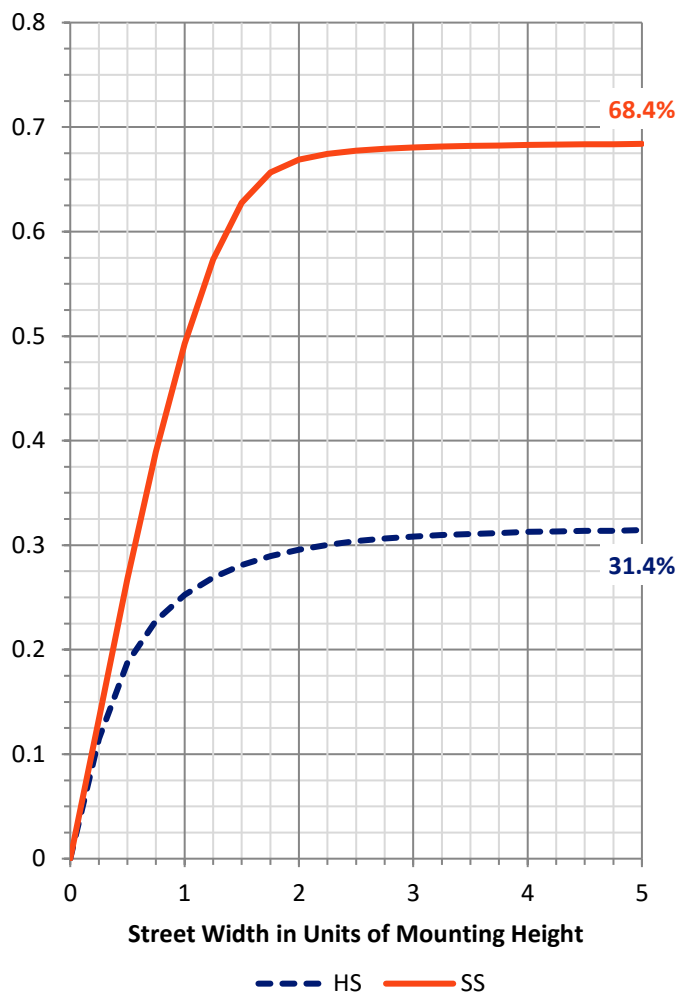
FLUX DISTRIBUTION:

| | | Downward | Upward | Total |
|--------------------|-----------|----------|--------|--------|
| House Side | Lumens | 1370.4 | 0.0 | 1370.4 |
| | % Fixture | 31.6 | 0.0 | 31.6 |
| Street Side | Lumens | 2959.6 | 0.0 | 2959.6 |
| | % Fixture | 68.4 | 0.0 | 68.4 |
| Total | Lumens | 4330.0 | 0.0 | 4330.0 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

ZONAL LUMENS:

| Zone | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10° | 79.2 | 1.8 |
| 10°-20° | 260.5 | 6.0 |
| 20°-30° | 469.1 | 10.8 |
| 30°-40° | 708.5 | 16.4 |
| 40°-50° | 954.0 | 22.0 |
| 50°-60° | 1146.4 | 26.5 |
| 60°-70° | 558.3 | 12.9 |
| 70°-80° | 137.5 | 3.2 |
| 80°-90° | 16.5 | 0.4 |
| 90°-100° | 0.0 | 0.0 |
| 100°-110° | 0.0 | 0.0 |
| 110°-120° | 0.0 | 0.0 |
| 120°-130° | 0.0 | 0.0 |
| 130°-140° | 0.0 | 0.0 |
| 140°-150° | 0.0 | 0.0 |
| 150°-160° | 0.0 | 0.0 |
| 160°-170° | 0.0 | 0.0 |
| 170°-180° | 0.0 | 0.0 |
| 0°-90° | 4330.0 | 100.0 |
| 0°-180° | 4330.0 | 100.0 |

Coefficient of Utilization



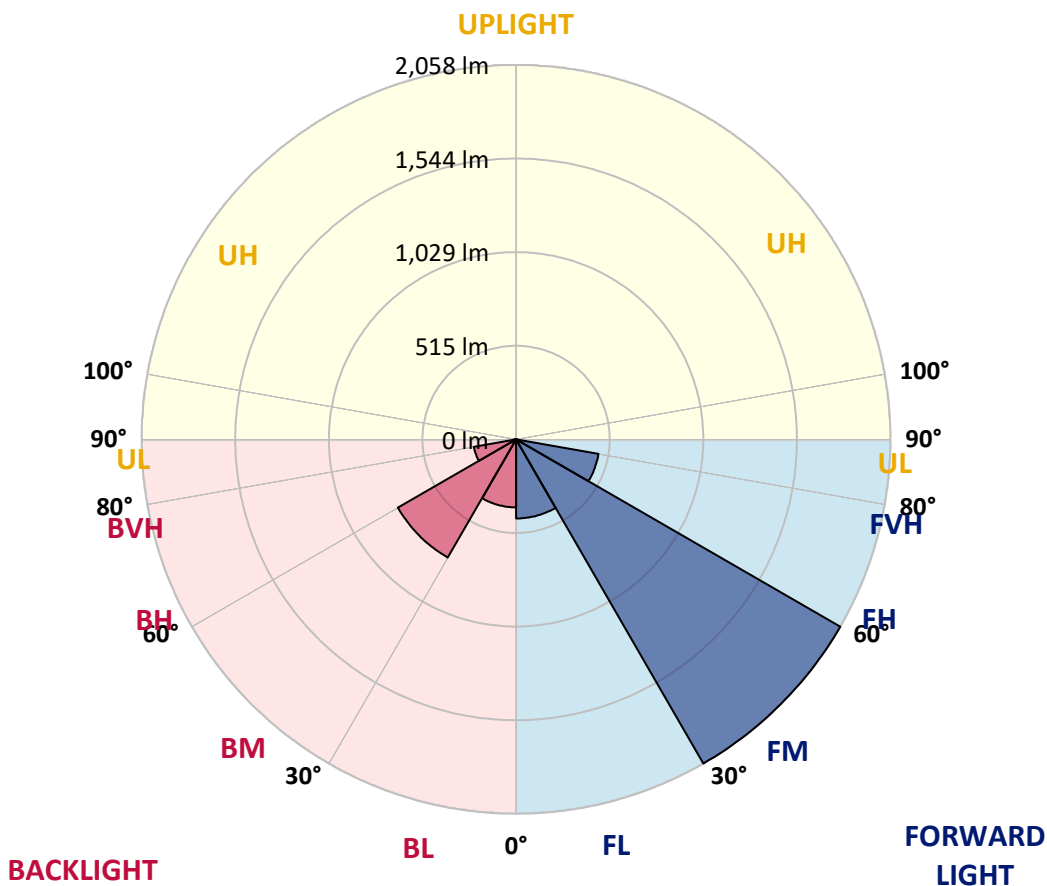
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LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | Lumens | % Fixture | Zone Rating/Lumen Limit | | |
|----------------|--------|-----------|-------------------------|------|--------|
| | | | B | U | G |
| FL (0°-30°) | 434.9 | 10.0 | | | |
| FM (30°-60°) | 2058.3 | 47.5 | | | |
| FH (60°-80°) | 460.2 | 10.6 | | | G0/660 |
| FVH (80°-90°) | 6.2 | 0.1 | | | G0/10 |
| BL (0°-30°) | 373.8 | 8.6 | B1/500 | | |
| BM (30°-60°) | 750.6 | 17.3 | B1/1000 | | |
| BH (60°-80°) | 235.7 | 5.4 | B1/500 | | G1/500 |
| BVH (80°-90°) | 10.3 | 0.2 | | | 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 Short





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CANDELA DISTRIBUTION (FULL):

| | 0° | 5° | 15° | 25° | 35° | 45° | 47° | 55° | 65° | 75° | 85° |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0° | 803.0 | 803.0 | 803.0 | 803.0 | 803.0 | 803.0 | 803.0 | 803.0 | 803.0 | 803.0 | 803.0 |
| 2.5° | 801.6 | 801.2 | 801.2 | 803.4 | 803.4 | 804.1 | 805.2 | 806.3 | 806.6 | 804.8 | 800.8 |
| 5° | 810.3 | 810.3 | 810.3 | 812.1 | 812.1 | 812.8 | 814.3 | 814.6 | 814.3 | 811.4 | 807.4 |
| 7.5° | 824.1 | 824.1 | 824.5 | 826.6 | 828.5 | 829.6 | 832.1 | 831.7 | 830.6 | 825.9 | 820.8 |
| 10° | 846.6 | 847.7 | 848.8 | 851.4 | 855.0 | 857.6 | 859.4 | 859.4 | 857.9 | 850.6 | 844.1 |
| 12.5° | 878.7 | 880.1 | 881.2 | 883.4 | 886.3 | 890.7 | 894.7 | 894.7 | 892.8 | 883.7 | 873.9 |
| 15° | 916.1 | 917.6 | 917.2 | 917.9 | 923.4 | 929.6 | 932.8 | 935.0 | 935.7 | 923.0 | 907.7 |
| 17.5° | 959.0 | 960.5 | 959.0 | 956.8 | 957.6 | 967.4 | 973.2 | 981.2 | 985.9 | 968.8 | 944.5 |
| 20° | 997.9 | 996.5 | 996.5 | 997.9 | 1000.1 | 1012.1 | 1020.8 | 1033.9 | 1039.8 | 1019.0 | 981.2 |
| 22.5° | 1039.0 | 1042.3 | 1040.9 | 1040.9 | 1049.6 | 1069.6 | 1080.1 | 1097.2 | 1103.4 | 1076.5 | 1025.6 |
| 25° | 1092.1 | 1095.0 | 1094.3 | 1095.0 | 1105.2 | 1133.6 | 1144.1 | 1175.8 | 1182.0 | 1143.4 | 1074.7 |
| 27.5° | 1150.3 | 1155.0 | 1157.2 | 1156.5 | 1172.9 | 1210.0 | 1223.1 | 1267.1 | 1278.3 | 1218.3 | 1127.0 |
| 30° | 1226.0 | 1231.1 | 1232.9 | 1232.1 | 1251.4 | 1302.0 | 1316.9 | 1367.1 | 1383.1 | 1307.1 | 1193.6 |
| 32.5° | 1313.6 | 1318.7 | 1324.2 | 1326.3 | 1351.1 | 1402.7 | 1424.2 | 1476.2 | 1499.1 | 1409.6 | 1274.0 |
| 35° | 1400.5 | 1404.9 | 1415.4 | 1432.5 | 1466.4 | 1519.1 | 1538.0 | 1589.3 | 1611.5 | 1516.2 | 1371.1 |
| 37.5° | 1496.5 | 1499.5 | 1508.5 | 1532.2 | 1580.9 | 1631.1 | 1650.0 | 1699.1 | 1701.7 | 1619.1 | 1480.9 |
| 40° | 1601.6 | 1601.6 | 1599.8 | 1623.1 | 1674.0 | 1724.6 | 1740.9 | 1769.3 | 1754.4 | 1698.4 | 1587.8 |
| 42.5° | 1690.7 | 1689.3 | 1690.7 | 1712.6 | 1750.4 | 1791.5 | 1805.7 | 1800.2 | 1781.3 | 1759.1 | 1684.6 |
| 45° | 1771.1 | 1772.2 | 1785.3 | 1802.0 | 1821.7 | 1846.0 | 1854.4 | 1823.5 | 1806.4 | 1807.9 | 1762.0 |
| 47.5° | 1825.7 | 1826.8 | 1857.3 | 1885.3 | 1897.3 | 1905.0 | 1901.3 | 1858.4 | 1849.7 | 1866.0 | 1821.7 |
| 50° | 1832.9 | 1838.8 | 1891.5 | 1949.0 | 1978.8 | 1979.9 | 1969.7 | 1917.3 | 1914.8 | 1933.3 | 1853.7 |
| 52.5° | 1834.4 | 1840.2 | 1906.0 | 2009.7 | 2087.2 | 2103.5 | 2091.9 | 2037.3 | 2010.8 | 1992.2 | 1893.0 |
| 55° | 1828.9 | 1835.5 | 1908.2 | 2050.4 | 2198.8 | 2264.3 | 2265.4 | 2188.3 | 2103.5 | 2091.2 | 2005.0 |
| 57.5° | 1614.7 | 1617.3 | 1730.0 | 1946.8 | 2194.4 | 2379.9 | 2394.1 | 2289.4 | 2192.6 | 2181.0 | 2094.8 |
| 60° | 1124.9 | 1135.0 | 1257.6 | 1543.8 | 1843.5 | 2170.4 | 2216.3 | 2185.7 | 2121.0 | 2036.2 | 1797.3 |
| 62.5° | 563.3 | 572.1 | 695.0 | 965.6 | 1271.4 | 1529.6 | 1578.7 | 1611.1 | 1626.4 | 1535.5 | 1223.8 |
| 65° | 242.6 | 249.1 | 325.5 | 504.4 | 719.7 | 844.5 | 861.6 | 900.5 | 995.8 | 888.5 | 659.4 |
| 67.5° | 162.2 | 166.6 | 205.5 | 307.7 | 424.1 | 432.1 | 429.5 | 437.9 | 458.6 | 378.6 | 297.9 |
| 70° | 124.4 | 128.0 | 154.2 | 225.5 | 304.8 | 260.8 | 246.9 | 224.0 | 243.3 | 248.0 | 241.5 |
| 72.5° | 90.2 | 93.1 | 112.7 | 153.8 | 190.9 | 166.6 | 164.4 | 176.0 | 202.2 | 209.5 | 205.5 |
| 75° | 58.2 | 59.6 | 71.6 | 84.4 | 98.6 | 106.9 | 111.3 | 132.4 | 158.9 | 164.4 | 159.7 |
| 77.5° | 38.9 | 40.0 | 46.9 | 54.2 | 56.0 | 56.4 | 57.8 | 67.3 | 85.5 | 95.6 | 94.6 |
| 80° | 20.4 | 20.4 | 22.9 | 22.9 | 26.2 | 31.3 | 32.7 | 38.9 | 47.3 | 52.4 | 52.7 |
| 82.5° | 8.0 | 8.4 | 9.8 | 10.9 | 13.1 | 16.0 | 17.1 | 20.4 | 24.7 | 28.4 | 31.6 |
| 85° | 3.3 | 3.6 | 4.0 | 4.7 | 5.8 | 7.3 | 7.6 | 8.7 | 11.6 | 14.5 | 16.4 |
| 87.5° | 0.0 | 0.0 | 0.4 | 0.4 | 0.7 | 1.1 | 1.1 | 1.5 | 1.8 | 3.3 | 4.4 |
| 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: P632007

CATALOG NUMBER: GWS-SA2B-827-U-T3-W-GRSWH

CANDELA DISTRIBUTION (continued):

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|-------|--------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0° | 803.0 | 803.0 | 803.0 | 803.0 | 803.0 | 803.0 | 803.0 | 803.0 | 803.0 | 803.0 | 803.0 |
| 2.5° | 805.6 | 800.8 | 805.6 | 807.0 | 811.0 | 812.5 | 809.9 | 809.6 | 809.6 | 805.9 | 804.8 |
| 5° | 811.0 | 806.6 | 811.4 | 813.6 | 819.4 | 823.0 | 823.7 | 826.6 | 828.5 | 827.0 | 826.6 |
| 7.5° | 824.5 | 819.0 | 824.1 | 827.4 | 835.0 | 840.8 | 843.4 | 849.9 | 854.6 | 853.9 | 853.6 |
| 10° | 848.1 | 840.8 | 846.6 | 852.1 | 860.5 | 867.4 | 867.7 | 871.4 | 876.1 | 874.6 | 873.9 |
| 12.5° | 875.4 | 868.5 | 875.0 | 880.5 | 890.3 | 893.2 | 888.5 | 887.0 | 887.7 | 885.9 | 884.5 |
| 15° | 908.8 | 899.0 | 904.8 | 911.0 | 916.5 | 913.2 | 903.0 | 899.0 | 898.7 | 896.1 | 894.7 |
| 17.5° | 942.3 | 929.9 | 934.3 | 937.6 | 935.0 | 924.8 | 912.1 | 905.2 | 901.9 | 896.8 | 895.4 |
| 20° | 975.4 | 959.8 | 959.0 | 956.5 | 944.8 | 926.3 | 909.2 | 895.4 | 887.0 | 880.1 | 877.6 |
| 22.5° | 1013.2 | 991.4 | 980.5 | 968.8 | 943.4 | 913.2 | 887.4 | 867.7 | 854.3 | 845.6 | 842.6 |
| 25° | 1053.9 | 1023.0 | 1000.5 | 977.2 | 928.8 | 885.2 | 849.2 | 822.3 | 806.3 | 796.8 | 793.5 |
| 27.5° | 1094.3 | 1051.8 | 1017.9 | 978.3 | 899.7 | 844.8 | 796.5 | 760.1 | 744.1 | 736.5 | 733.9 |
| 30° | 1148.9 | 1089.9 | 1038.7 | 964.1 | 861.6 | 788.8 | 728.5 | 691.7 | 681.2 | 675.7 | 673.5 |
| 32.5° | 1211.8 | 1138.3 | 1066.3 | 934.3 | 812.8 | 723.4 | 659.7 | 634.3 | 627.0 | 616.4 | 616.1 |
| 35° | 1294.7 | 1207.4 | 1092.5 | 890.3 | 751.4 | 653.2 | 607.0 | 588.8 | 575.7 | 559.0 | 557.5 |
| 37.5° | 1391.4 | 1293.6 | 1106.7 | 834.3 | 679.7 | 595.3 | 567.7 | 547.3 | 526.2 | 504.1 | 501.2 |
| 40° | 1491.5 | 1394.3 | 1107.8 | 768.1 | 609.5 | 557.2 | 533.9 | 507.3 | 481.1 | 456.4 | 453.1 |
| 42.5° | 1596.6 | 1488.2 | 1088.5 | 691.7 | 552.1 | 524.1 | 500.4 | 467.0 | 437.5 | 420.8 | 419.0 |
| 45° | 1690.4 | 1563.8 | 1044.9 | 611.3 | 509.5 | 496.4 | 466.2 | 430.2 | 414.6 | 402.6 | 400.0 |
| 47.5° | 1764.2 | 1614.0 | 985.9 | 539.3 | 475.0 | 468.1 | 428.8 | 410.2 | 398.2 | 387.3 | 384.8 |
| 50° | 1800.6 | 1625.3 | 909.2 | 480.8 | 443.0 | 434.6 | 407.7 | 393.5 | 385.5 | 376.8 | 374.6 |
| 52.5° | 1845.7 | 1638.0 | 843.0 | 431.7 | 411.7 | 400.4 | 390.2 | 379.0 | 373.1 | 367.7 | 365.9 |
| 55° | 1949.3 | 1686.0 | 808.1 | 392.4 | 381.9 | 376.8 | 375.3 | 365.9 | 364.0 | 360.4 | 357.1 |
| 57.5° | 1991.5 | 1655.1 | 725.5 | 360.4 | 358.2 | 359.0 | 362.6 | 353.9 | 352.0 | 347.7 | 345.5 |
| 60° | 1601.6 | 1251.1 | 491.3 | 332.8 | 338.6 | 343.3 | 347.0 | 338.2 | 335.7 | 334.9 | 332.0 |
| 62.5° | 1026.3 | 769.5 | 342.9 | 306.9 | 315.7 | 321.5 | 323.7 | 315.3 | 313.5 | 319.3 | 319.7 |
| 65° | 534.2 | 419.3 | 278.2 | 279.3 | 286.6 | 295.3 | 299.7 | 296.8 | 296.0 | 302.2 | 302.6 |
| 67.5° | 272.8 | 256.4 | 242.6 | 246.6 | 252.4 | 263.7 | 273.9 | 286.6 | 290.9 | 291.7 | 292.0 |
| 70° | 232.4 | 225.1 | 218.2 | 220.8 | 226.9 | 233.1 | 242.9 | 249.1 | 241.8 | 240.0 | 239.3 |
| 72.5° | 197.8 | 192.4 | 189.1 | 192.0 | 195.3 | 194.2 | 191.3 | 194.2 | 195.3 | 195.7 | 196.0 |
| 75° | 153.8 | 149.8 | 147.3 | 147.7 | 147.7 | 143.7 | 138.2 | 134.9 | 131.3 | 128.4 | 128.4 |
| 77.5° | 94.2 | 94.9 | 97.5 | 97.1 | 96.7 | 95.3 | 89.8 | 86.9 | 78.2 | 75.6 | 75.6 |
| 80° | 53.8 | 54.9 | 57.5 | 58.2 | 58.2 | 56.4 | 50.9 | 47.6 | 43.6 | 41.8 | 41.5 |
| 82.5° | 32.7 | 34.2 | 35.6 | 36.4 | 36.7 | 34.5 | 29.8 | 27.3 | 25.1 | 23.3 | 23.3 |
| 85° | 17.1 | 17.8 | 19.3 | 19.6 | 18.5 | 16.4 | 13.8 | 12.7 | 10.5 | 10.2 | 10.2 |
| 87.5° | 4.7 | 5.1 | 5.8 | 4.7 | 4.4 | 3.3 | 1.8 | 1.5 | 0.7 | 0.4 | 0.4 |
| 90° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

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



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

Report Prepared for

Cooper Lighting Solutions

Invue

Report Number: SP1-2407-157-9

Test Date: 10/03/2024

Luminaire Tested: EMM2-HTN-SA1A-827-U-5WQ

Data applicable to all product families utilizing light square engine

Test Information

Test Method: LM-79-2019
 Report Number: SP1-2407-157-9
 Test Lab: COOPER LIGHTING SOLUTIONS
 Photometer: SP1 - 76IN SPHERE
 Measurement Geometry: 4π
 Issue Date: 10/03/2024
 Manufacturer: COOPER LIGHTING SOLUTIONS
 Product Line: Invue
 Catalog Number: **EMM2-HTN-SA1A-827-U-5WQ**
 Description: Epic Modern Light Square 40W 5WQ Optic

Spectral Parameters

CCT (K): 2764
 CIE u': 0.2591
 CIE v': 0.5290
 Duv: 0.0020
 CIE x: 0.4581
 CIE y: 0.4156
 CIE z: 0.1263
 Peak Wavelength (nm): 603
 Dominant Wavelength (nm): 583
 Purity: 62.2537
 Rf: 84.7
 Rg: 94.6

| | | | |
|-----------|------|------|------|
| CRI (Ra): | 80.9 | | |
| R1: | 78.8 | R9: | -1.5 |
| R2: | 89.9 | R10: | 77.9 |
| R3: | 96.2 | R11: | 78.9 |
| R4: | 79.1 | R12: | 71.6 |
| R5: | 79.1 | R13: | 81.2 |
| R6: | 88.8 | R14: | 98.5 |
| R7: | 81.3 | R15: | 69.9 |
| R8: | 54.3 | | |



Test Conditions

Stabilization Time: 81M
 Operation Time: 2H 21M
 Sphere Temperature (°C): 25.2

REPORT NUMBER: SP1-2407-157-9

| Measurement and Test Equipment | | | |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument | Identification Number | Calibration Date | Calibration Due Date |
| Photometer | IN0058 | 6/18/2024 | 12/18/2024 |
| Power Meter | INXT2011004 | 2/8/2024 | 2/8/2025 |
| AC Power Source | IN0063 | 10/24/2023 | 10/24/2024 |
| DC Power Source | IN0208 | 10/24/2023 | 10/24/2024 |
| Sphere Thermometer | IN0085 | 10/24/2023 | 10/24/2024 |
| Room Thermometer | IN0046 | 10/24/2023 | 10/24/2024 |

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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: 4337.9

| λ (nm) | Power ($\mu\text{W}/\text{nm}$) | Lumens (ϕ/nm) | λ (nm) | Power ($\mu\text{W}/\text{nm}$) | Lumens (ϕ/nm) | λ (nm) | Power ($\mu\text{W}/\text{nm}$) | Lumens (ϕ/nm) | λ (nm) | Power ($\mu\text{W}/\text{nm}$) | Lumens (ϕ/nm) | λ (nm) | Power ($\mu\text{W}/\text{nm}$) | Lumens (ϕ/nm) |
|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|
| 360 | 0 | 0.0 | 490 | 18018 | 2.6 | 620 | 87426 | 22.8 | 750 | 2680 | 0.0 | 880 | 58 | 0.0 |
| 365 | 0 | 0.0 | 495 | 22295 | 3.9 | 625 | 83013 | 18.2 | 755 | 2287 | 0.0 | 885 | 46 | 0.0 |
| 370 | 0 | 0.0 | 500 | 26478 | 5.8 | 630 | 78077 | 14.1 | 760 | 1944 | 0.0 | 890 | 45 | 0.0 |
| 375 | 0 | 0.0 | 505 | 30524 | 8.5 | 635 | 72080 | 10.7 | 765 | 1653 | 0.0 | 895 | 41 | 0.0 |
| 380 | 0 | 0.0 | 510 | 33611 | 11.5 | 640 | 66249 | 7.9 | 770 | 1413 | 0.0 | 900 | 38 | 0.0 |
| 385 | 0 | 0.0 | 515 | 36490 | 15.2 | 645 | 59973 | 5.7 | 775 | 1198 | 0.0 | 905 | 33 | 0.0 |
| 390 | 0 | 0.0 | 520 | 38610 | 18.7 | 650 | 53972 | 3.9 | 780 | 1025 | 0.0 | 910 | 30 | 0.0 |
| 395 | 0 | 0.0 | 525 | 40511 | 21.9 | 655 | 48369 | 2.7 | 785 | 874 | 0.0 | 915 | 23 | 0.0 |
| 400 | 48 | 0.0 | 530 | 42223 | 24.9 | 660 | 42641 | 1.8 | 790 | 747 | 0.0 | 920 | 24 | 0.0 |
| 405 | 201 | 0.0 | 535 | 44137 | 27.6 | 665 | 37602 | 1.1 | 795 | 639 | 0.0 | 925 | 22 | 0.0 |
| 410 | 457 | 0.0 | 540 | 46032 | 30.0 | 670 | 32798 | 0.7 | 800 | 547 | 0.0 | 930 | 22 | 0.0 |
| 415 | 925 | 0.0 | 545 | 48553 | 32.5 | 675 | 28558 | 0.5 | 805 | 473 | 0.0 | 935 | 17 | 0.0 |
| 420 | 1816 | 0.0 | 550 | 51408 | 34.9 | 680 | 24782 | 0.3 | 810 | 401 | 0.0 | 940 | 13 | 0.0 |
| 425 | 3217 | 0.0 | 555 | 54711 | 37.4 | 685 | 21386 | 0.2 | 815 | 351 | 0.0 | 945 | 6 | 0.0 |
| 430 | 5520 | 0.0 | 560 | 58847 | 40.0 | 690 | 18413 | 0.1 | 820 | 307 | 0.0 | 950 | 10 | 0.0 |
| 435 | 9225 | 0.1 | 565 | 63386 | 42.4 | 695 | 15721 | 0.1 | 825 | 261 | 0.0 | 955 | 11 | 0.0 |
| 440 | 15522 | 0.2 | 570 | 68196 | 44.3 | 700 | 13432 | 0.0 | 830 | 228 | 0.0 | 960 | 8 | 0.0 |
| 445 | 27642 | 0.6 | 575 | 73613 | 46.0 | 705 | 11513 | 0.0 | 835 | 193 | 0.0 | 965 | 12 | 0.0 |
| 450 | 36602 | 0.9 | 580 | 79207 | 47.1 | 710 | 9780 | 0.0 | 840 | 174 | 0.0 | 970 | 3 | 0.0 |
| 455 | 28292 | 0.9 | 585 | 84248 | 47.0 | 715 | 8356 | 0.0 | 845 | 151 | 0.0 | 975 | 8 | 0.0 |
| 460 | 21166 | 0.9 | 590 | 88397 | 45.7 | 720 | 7161 | 0.0 | 850 | 123 | 0.0 | 980 | 2 | 0.0 |
| 465 | 19092 | 1.0 | 595 | 91428 | 43.4 | 725 | 6067 | 0.0 | 855 | 106 | 0.0 | 985 | 13 | 0.0 |
| 470 | 14951 | 0.9 | 600 | 93452 | 40.3 | 730 | 5164 | 0.0 | 860 | 95 | 0.0 | 990 | 16 | 0.0 |
| 475 | 12606 | 1.0 | 605 | 93959 | 36.4 | 735 | 4393 | 0.0 | 865 | 82 | 0.0 | 995 | 20 | 0.0 |
| 480 | 13323 | 1.3 | 610 | 93079 | 32.0 | 740 | 3694 | 0.0 | 870 | 77 | 0.0 | 1000 | 0 | 0.0 |
| 485 | 15164 | 1.8 | 615 | 90707 | 27.3 | 745 | 3157 | 0.0 | 875 | 65 | 0.0 | | | |

REPORT NUMBER: SP1-2407-157-9

Scotopic Flux vs. Wavelength



Scotopic Lumens: 5286.7

S/P: 1.22

| λ (nm) | Power ($\mu\text{W}/\text{nm}$) | Lumens (ϕ/nm) | λ (nm) | Power ($\mu\text{W}/\text{nm}$) | Lumens (ϕ/nm) | λ (nm) | Power ($\mu\text{W}/\text{nm}$) | Lumens (ϕ/nm) | λ (nm) | Power ($\mu\text{W}/\text{nm}$) | Lumens (ϕ/nm) | λ (nm) | Power ($\mu\text{W}/\text{nm}$) | Lumens (ϕ/nm) |
|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|
| 360 | 0 | 0.0 | 490 | 18018 | 75.9 | 620 | 87426 | 0.4 | 750 | 2680 | 0.0 | 880 | 58 | 0.0 |
| 365 | 0 | 0.0 | 495 | 22295 | 93.2 | 625 | 83013 | 0.2 | 755 | 2287 | 0.0 | 885 | 46 | 0.0 |
| 370 | 0 | 0.0 | 500 | 26478 | 107.8 | 630 | 78077 | 0.1 | 760 | 1944 | 0.0 | 890 | 45 | 0.0 |
| 375 | 0 | 0.0 | 505 | 30524 | 118.7 | 635 | 72080 | 0.1 | 765 | 1653 | 0.0 | 895 | 41 | 0.0 |
| 380 | 0 | 0.0 | 510 | 33611 | 122.2 | 640 | 66249 | 0.1 | 770 | 1413 | 0.0 | 900 | 38 | 0.0 |
| 385 | 0 | 0.0 | 515 | 36490 | 120.8 | 645 | 59973 | 0.0 | 775 | 1198 | 0.0 | 905 | 33 | 0.0 |
| 390 | 0 | 0.0 | 520 | 38610 | 113.9 | 650 | 53972 | 0.0 | 780 | 1025 | 0.0 | 910 | 30 | 0.0 |
| 395 | 0 | 0.0 | 525 | 40511 | 104.1 | 655 | 48369 | 0.0 | 785 | 874 | 0.0 | 915 | 23 | 0.0 |
| 400 | 48 | 0.0 | 530 | 42223 | 92.4 | 660 | 42641 | 0.0 | 790 | 747 | 0.0 | 920 | 24 | 0.0 |
| 405 | 201 | 0.0 | 535 | 44137 | 80.5 | 665 | 37602 | 0.0 | 795 | 639 | 0.0 | 925 | 22 | 0.0 |
| 410 | 457 | 0.1 | 540 | 46032 | 68.2 | 670 | 32798 | 0.0 | 800 | 547 | 0.0 | 930 | 22 | 0.0 |
| 415 | 925 | 0.3 | 545 | 48553 | 57.1 | 675 | 28558 | 0.0 | 805 | 473 | 0.0 | 935 | 17 | 0.0 |
| 420 | 1816 | 1.1 | 550 | 51408 | 46.7 | 680 | 24782 | 0.0 | 810 | 401 | 0.0 | 940 | 13 | 0.0 |
| 425 | 3217 | 2.5 | 555 | 54711 | 37.4 | 685 | 21386 | 0.0 | 815 | 351 | 0.0 | 945 | 6 | 0.0 |
| 430 | 5520 | 5.9 | 560 | 58847 | 29.4 | 690 | 18413 | 0.0 | 820 | 307 | 0.0 | 950 | 10 | 0.0 |
| 435 | 9225 | 12.5 | 565 | 63386 | 22.5 | 695 | 15721 | 0.0 | 825 | 261 | 0.0 | 955 | 11 | 0.0 |
| 440 | 15522 | 26.3 | 570 | 68196 | 16.9 | 700 | 13432 | 0.0 | 830 | 228 | 0.0 | 960 | 8 | 0.0 |
| 445 | 27642 | 55.2 | 575 | 73613 | 12.4 | 705 | 11513 | 0.0 | 835 | 193 | 0.0 | 965 | 12 | 0.0 |
| 450 | 36602 | 85.4 | 580 | 79207 | 9.0 | 710 | 9780 | 0.0 | 840 | 174 | 0.0 | 970 | 3 | 0.0 |
| 455 | 28292 | 75.1 | 585 | 84248 | 6.3 | 715 | 8356 | 0.0 | 845 | 151 | 0.0 | 975 | 8 | 0.0 |
| 460 | 21166 | 63.2 | 590 | 88397 | 4.4 | 720 | 7161 | 0.0 | 850 | 123 | 0.0 | 980 | 2 | 0.0 |
| 465 | 19092 | 63.2 | 595 | 91428 | 3.0 | 725 | 6067 | 0.0 | 855 | 106 | 0.0 | 985 | 13 | 0.0 |
| 470 | 14951 | 54.2 | 600 | 93452 | 2.0 | 730 | 5164 | 0.0 | 860 | 95 | 0.0 | 990 | 16 | 0.0 |
| 475 | 12606 | 48.8 | 605 | 93959 | 1.3 | 735 | 4393 | 0.0 | 865 | 82 | 0.0 | 995 | 20 | 0.0 |
| 480 | 13323 | 54.2 | 610 | 93079 | 0.9 | 740 | 3694 | 0.0 | 870 | 77 | 0.0 | 1000 | 0 | 0.0 |
| 485 | 15164 | 63.3 | 615 | 90707 | 0.5 | 745 | 3157 | 0.0 | 875 | 65 | 0.0 | | | |

REPORT NUMBER: SP1-2407-157-9

Melanopic Flux vs. Wavelength



Melanopic Lumens: 9797

M/P: 2.26

| λ (nm) | Power (μ W/nm) | Lumens (ϕ /nm) | λ (nm) | Power (μ W/nm) | Lumens (ϕ /nm) | λ (nm) | Power (μ W/nm) | Lumens (ϕ /nm) | λ (nm) | Power (μ W/nm) | Lumens (ϕ /nm) | λ (nm) | Power (μ W/nm) | Lumens (ϕ /nm) |
|-------------------|------------------------|-------------------------|-------------------|------------------------|-------------------------|-------------------|------------------------|-------------------------|-------------------|------------------------|-------------------------|-------------------|------------------------|-------------------------|
| 360 | 0 | 0.0 | 490 | 18018 | 27.7 | 620 | 87426 | 1.1 | 750 | 2680 | 0.0 | 880 | 58 | 0.0 |
| 365 | 0 | 0.0 | 495 | 22295 | 36.0 | 625 | 83013 | 0.7 | 755 | 2287 | 0.0 | 885 | 46 | 0.0 |
| 370 | 0 | 0.0 | 500 | 26478 | 44.2 | 630 | 78077 | 0.4 | 760 | 1944 | 0.0 | 890 | 45 | 0.0 |
| 375 | 0 | 0.0 | 505 | 30524 | 51.8 | 635 | 72080 | 0.3 | 765 | 1653 | 0.0 | 895 | 41 | 0.0 |
| 380 | 0 | 0.0 | 510 | 33611 | 57.0 | 640 | 66249 | 0.2 | 770 | 1413 | 0.0 | 900 | 38 | 0.0 |
| 385 | 0 | 0.0 | 515 | 36490 | 60.5 | 645 | 59973 | 0.1 | 775 | 1198 | 0.0 | 905 | 33 | 0.0 |
| 390 | 0 | 0.0 | 520 | 38610 | 61.4 | 650 | 53972 | 0.1 | 780 | 1025 | 0.0 | 910 | 30 | 0.0 |
| 395 | 0 | 0.0 | 525 | 40511 | 60.6 | 655 | 48369 | 0.0 | 785 | 874 | 0.0 | 915 | 23 | 0.0 |
| 400 | 48 | 0.0 | 530 | 42223 | 58.2 | 660 | 42641 | 0.0 | 790 | 747 | 0.0 | 920 | 24 | 0.0 |
| 405 | 201 | 0.0 | 535 | 44137 | 55.0 | 665 | 37602 | 0.0 | 795 | 639 | 0.0 | 925 | 22 | 0.0 |
| 410 | 457 | 0.0 | 540 | 46032 | 50.9 | 670 | 32798 | 0.0 | 800 | 547 | 0.0 | 930 | 22 | 0.0 |
| 415 | 925 | 0.1 | 545 | 48553 | 46.6 | 675 | 28558 | 0.0 | 805 | 473 | 0.0 | 935 | 17 | 0.0 |
| 420 | 1816 | 0.3 | 550 | 51408 | 42.0 | 680 | 24782 | 0.0 | 810 | 401 | 0.0 | 940 | 13 | 0.0 |
| 425 | 3217 | 0.8 | 555 | 54711 | 37.4 | 685 | 21386 | 0.0 | 815 | 351 | 0.0 | 945 | 6 | 0.0 |
| 430 | 5520 | 1.9 | 560 | 58847 | 32.9 | 690 | 18413 | 0.0 | 820 | 307 | 0.0 | 950 | 10 | 0.0 |
| 435 | 9225 | 4.1 | 565 | 63386 | 28.4 | 695 | 15721 | 0.0 | 825 | 261 | 0.0 | 955 | 11 | 0.0 |
| 440 | 15522 | 8.7 | 570 | 68196 | 24.1 | 700 | 13432 | 0.0 | 830 | 228 | 0.0 | 960 | 8 | 0.0 |
| 445 | 27642 | 18.5 | 575 | 73613 | 20.0 | 705 | 11513 | 0.0 | 835 | 193 | 0.0 | 965 | 12 | 0.0 |
| 450 | 36602 | 28.3 | 580 | 79207 | 16.3 | 710 | 9780 | 0.0 | 840 | 174 | 0.0 | 970 | 3 | 0.0 |
| 455 | 28292 | 24.7 | 585 | 84248 | 12.9 | 715 | 8356 | 0.0 | 845 | 151 | 0.0 | 975 | 8 | 0.0 |
| 460 | 21166 | 20.4 | 590 | 88397 | 9.8 | 720 | 7161 | 0.0 | 850 | 123 | 0.0 | 980 | 2 | 0.0 |
| 465 | 19092 | 20.1 | 595 | 91428 | 7.3 | 725 | 6067 | 0.0 | 855 | 106 | 0.0 | 985 | 13 | 0.0 |
| 470 | 14951 | 17.2 | 600 | 93452 | 5.3 | 730 | 5164 | 0.0 | 860 | 95 | 0.0 | 990 | 16 | 0.0 |
| 475 | 12606 | 15.7 | 605 | 93959 | 3.7 | 735 | 4393 | 0.0 | 865 | 82 | 0.0 | 995 | 20 | 0.0 |
| 480 | 13323 | 18.0 | 610 | 93079 | 2.5 | 740 | 3694 | 0.0 | 870 | 77 | 0.0 | 1000 | 0 | 0.0 |
| 485 | 15164 | 21.9 | 615 | 90707 | 1.7 | 745 | 3157 | 0.0 | 875 | 65 | 0.0 | | | |

Summary

$R_f = 84.7$
 $R_g = 94.6$
 CIE $R_a = 80.9$
 $R_g = -1.5$



Color Vector Graphics



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

| | | | |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 84 | CES51 = 95 | CES76 = 81 |
| CES02 = 63 | CES27 = 95 | CES52 = 94 | CES77 = 84 |
| CES03 = 31 | CES28 = 94 | CES53 = 89 | CES78 = 81 |
| CES04 = 71 | CES29 = 87 | CES54 = 91 | CES79 = 89 |
| CES05 = 50 | CES30 = 94 | CES55 = 90 | CES80 = 89 |
| CES06 = 52 | CES31 = 89 | CES56 = 86 | CES81 = 69 |
| CES07 = 43 | CES32 = 82 | CES57 = 85 | CES82 = 96 |
| CES08 = 41 | CES33 = 91 | CES58 = 86 | CES83 = 93 |
| CES09 = 29 | CES34 = 92 | CES59 = 91 | CES84 = 92 |
| CES10 = 77 | CES35 = 96 | CES60 = 94 | CES85 = 76 |
| CES11 = 60 | CES36 = 90 | CES61 = 89 | CES86 = 65 |
| CES12 = 66 | CES37 = 96 | CES62 = 94 | CES87 = 84 |
| CES13 = 44 | CES38 = 98 | CES63 = 87 | CES88 = 86 |
| CES14 = 74 | CES39 = 98 | CES64 = 82 | CES89 = 73 |
| CES15 = 72 | CES40 = 95 | CES65 = 78 | CES90 = 88 |
| CES16 = 48 | CES41 = 96 | CES66 = 81 | CES91 = 82 |
| CES17 = 50 | CES42 = 97 | CES67 = 80 | CES92 = 64 |
| CES18 = 57 | CES43 = 91 | CES68 = 83 | CES93 = 78 |
| CES19 = 73 | CES44 = 99 | CES69 = 88 | CES94 = 59 |
| CES20 = 67 | CES45 = 93 | CES70 = 80 | CES95 = 74 |
| CES21 = 87 | CES46 = 89 | CES71 = 79 | CES96 = 83 |
| CES22 = 79 | CES47 = 92 | CES72 = 92 | CES97 = 88 |
| CES23 = 92 | CES48 = 83 | CES73 = 75 | CES98 = 83 |
| CES24 = 91 | CES49 = 90 | CES74 = 91 | CES99 = 74 |
| CES25 = 72 | CES50 = 94 | CES75 = 81 | |



Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)