

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: P631988

Luminaire Tested: GWS-SA2B-827-U-SL4-W

Issue Date: 1/10/2023

Test Information

Test Method: LM-79-2019
Report Number: P631988
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2209-782-35)
Test Lab: COOPER LIGHTING SOLUTIONS
Issue Date: 1/10/2023
Manufacturer: COOPER LIGHTING SOLUTIONS
Product Line: McGRAW-EDISON
Catalog Number: GWS-SA2B-827-U-SL4-W
Description: GALLEON WALL SLIM LUMINAIRE. (2) LIGHTSQUARES WITH 16 LEDS EACH AND TYPE IV SPILL LIGHT ELIMINATOR OPTICS
Light Source: (32) 2700K CCT, 80 CRI LEDS
Ballast/Driver: -

Summary

Lumens per Lamp: N/A
Luminaire Lumens: 4872.3 lumens
Efficiency: N/A
Efficacy: 105.0 lumens/watt
Luminous Opening: Rectangular (W 1' x L: 0.5' x H: 0')
IES Classification: Type IV - Short
BUG Rating: B1 - U0 - G2

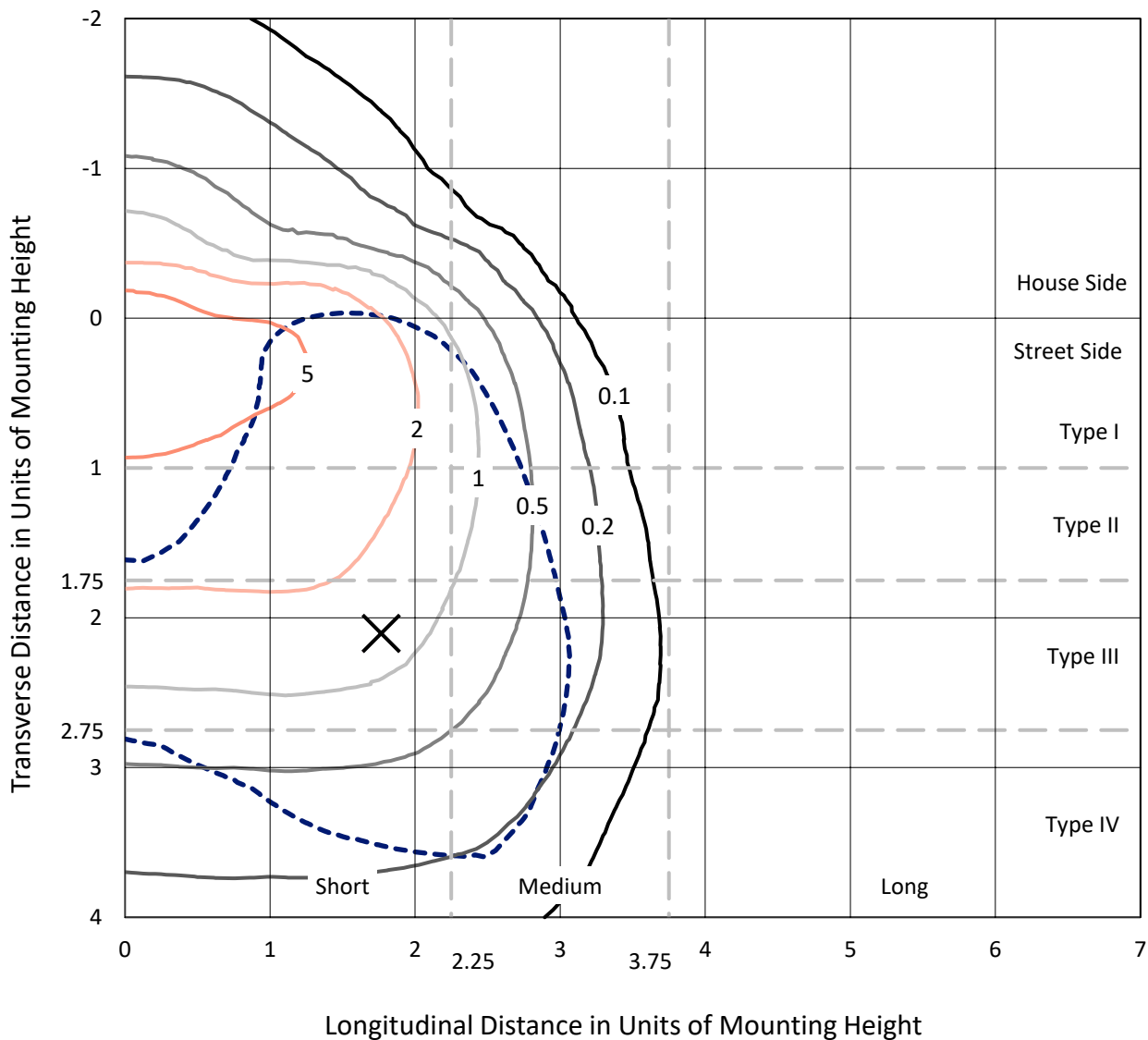
Input Watts (W): 46.4
Input Voltage (V): 120
Input Current (Ain): NR
Voltage Rise (V): NR
Power Factor: NR
Total Harmonic Distortion (THDi): NR
Frequency (hertz): 0
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 28.75 FT



REPORT NUMBER: P631988
 CATALOG NUMBER: GWS-SA2B-827-U-SL4-W

Iso-Footcandle Lines of Horizontal Illumination

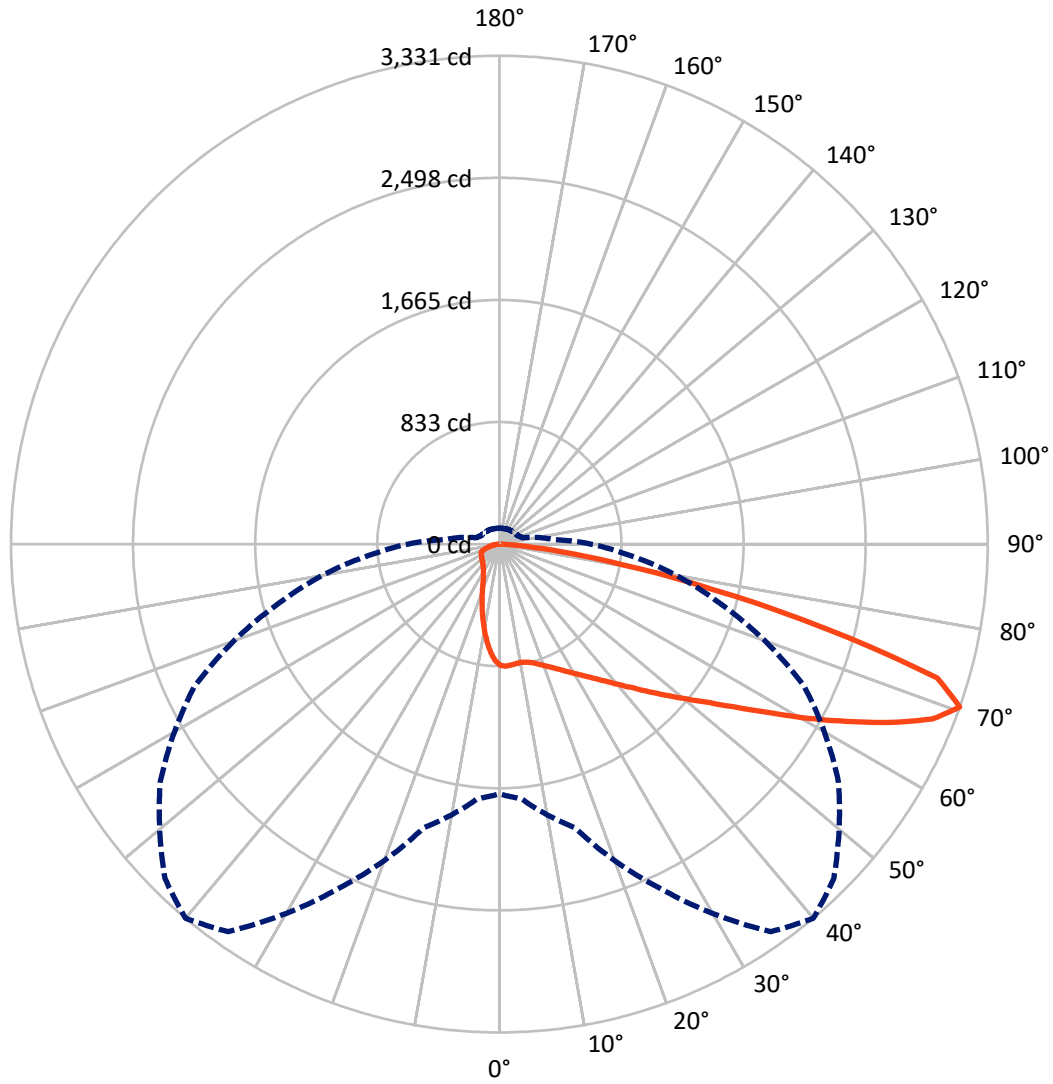
✕ Max cd
 - - - 1/2 Max cd



Based on 10 foot mounting height. Maximum calculated value = 8.3 fc
 Type IV - Short - N/A

REPORT NUMBER: P631988
CATALOG NUMBER: GWS-SA2B-827-U-SL4-W

Luminous Intensity Polar Plot



— Vertical Plane Through 40-Deg Lateral - - - Horizontal Cone Through 70-Deg Vertical

REPORT NUMBER: P631988

CATALOG NUMBER: GWS-SA2B-827-U-SL4-W

FLUX DISTRIBUTION:

| | | Downward | Upward | Total |
|--------------------|-----------|----------|--------|--------|
| House Side | Lumens | 750.4 | 0.0 | 750.4 |
| | % Fixture | 15.4 | 0.0 | 15.4 |
| Street Side | Lumens | 4121.8 | 0.0 | 4121.8 |
| | % Fixture | 84.6 | 0.0 | 84.6 |
| Total | Lumens | 4872.3 | 0.0 | 4872.3 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

ZONAL LUMENS:

| Zone | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10° | 73.1 | 1.5 |
| 10°-20° | 190.5 | 3.9 |
| 20°-30° | 299.1 | 6.1 |
| 30°-40° | 449.8 | 9.2 |
| 40°-50° | 694.2 | 14.2 |
| 50°-60° | 1031.0 | 21.2 |
| 60°-70° | 1299.6 | 26.7 |
| 70°-80° | 751.5 | 15.4 |
| 80°-90° | 83.4 | 1.7 |
| 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° | 4872.3 | 100.0 |
| 0°-180° | 4872.3 | 100.0 |

Coefficient of Utilization



REPORT NUMBER: P631988

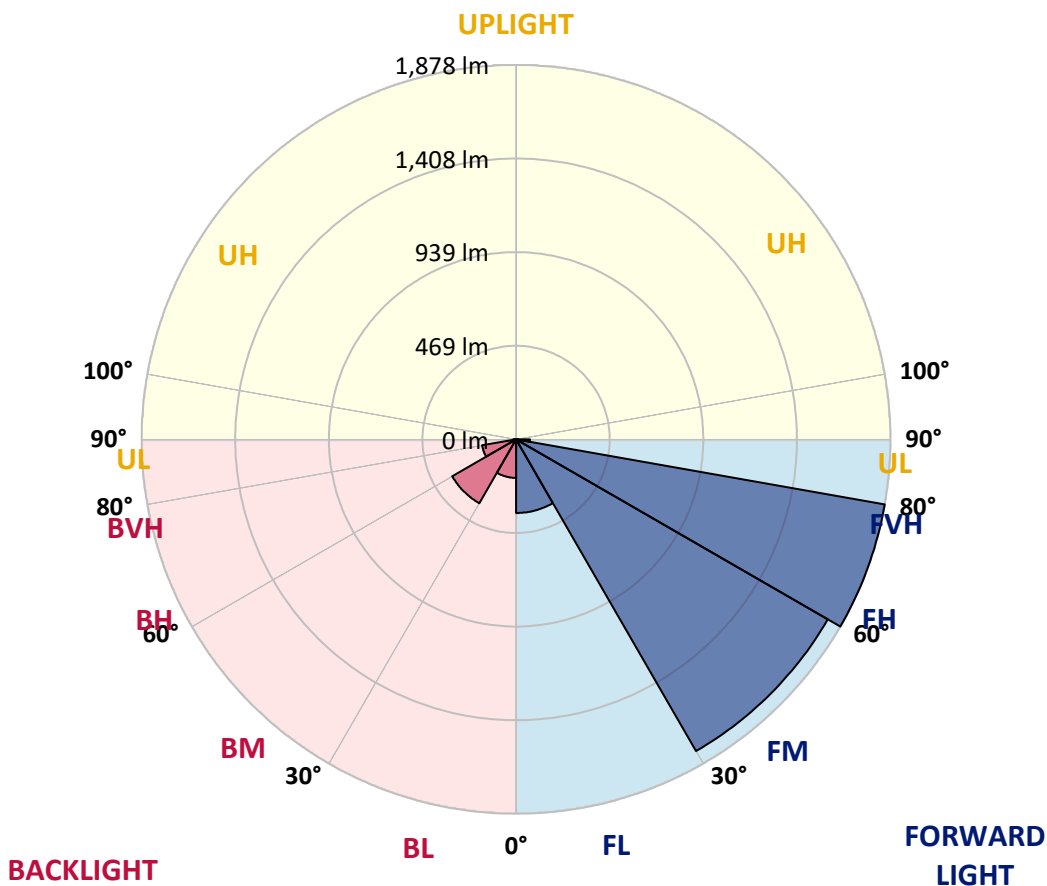
CATALOG NUMBER: GWS-SA2B-827-U-SL4-W

LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | Lumens | % Fixture | Zone Rating/Lumen Limit | | |
|----------------|--------|-----------|-------------------------|------|---------|
| | | | B | U | G |
| FL (0°-30°) | 369.4 | 7.6 | | | |
| FM (30°-60°) | 1805.1 | 37.0 | | | |
| FH (60°-80°) | 1877.9 | 38.5 | | | G2/5000 |
| FVH (80°-90°) | 69.5 | 1.4 | | | G1/100 |
| BL (0°-30°) | 193.4 | 4.0 | B1/500 | | |
| BM (30°-60°) | 369.9 | 7.6 | B1/1000 | | |
| BH (60°-80°) | 173.2 | 3.6 | B1/500 | | G1/500 |
| BVH (80°-90°) | 13.9 | 0.3 | | | G1/100 |
| UL (90°-100°) | 0.0 | 0.0 | | U0/0 | |
| UH (100°-180°) | 0.0 | 0.0 | | U0/0 | |

BUG Rating: B1-U0-G2

Type IV Short





REPORT NUMBER: P631988
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CANDELA DISTRIBUTION (FULL):

| | 0° | 5° | 15° | 25° | 35° | 40° | 45° | 55° | 65° | 75° | 85° |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0° | 827.4 | 827.4 | 827.4 | 827.4 | 827.4 | 827.4 | 827.4 | 827.4 | 827.4 | 827.4 | 827.4 |
| 2.5° | 832.5 | 833.9 | 835.0 | 836.5 | 835.7 | 833.6 | 835.4 | 835.4 | 831.4 | 827.0 | 823.0 |
| 5° | 833.6 | 835.4 | 835.0 | 834.6 | 831.7 | 828.1 | 828.1 | 825.9 | 819.0 | 812.1 | 805.6 |
| 7.5° | 831.4 | 831.0 | 830.6 | 829.6 | 826.3 | 822.3 | 821.6 | 817.2 | 808.1 | 798.6 | 789.2 |
| 10° | 821.6 | 821.2 | 822.3 | 824.8 | 824.1 | 820.5 | 820.5 | 816.5 | 805.9 | 794.3 | 781.9 |
| 12.5° | 813.6 | 813.6 | 817.9 | 824.8 | 827.4 | 825.9 | 826.3 | 823.4 | 811.4 | 797.6 | 783.0 |
| 15° | 814.6 | 815.0 | 824.5 | 835.7 | 840.5 | 839.4 | 839.7 | 836.5 | 823.0 | 809.2 | 789.5 |
| 17.5° | 821.9 | 823.7 | 840.1 | 855.7 | 861.9 | 860.5 | 857.9 | 852.5 | 837.2 | 821.6 | 797.6 |
| 20° | 837.2 | 840.1 | 861.2 | 880.8 | 888.1 | 884.8 | 880.5 | 869.6 | 852.8 | 835.7 | 806.3 |
| 22.5° | 867.4 | 869.2 | 892.5 | 911.7 | 917.6 | 913.6 | 904.8 | 889.2 | 869.9 | 852.1 | 816.8 |
| 25° | 909.9 | 912.1 | 934.3 | 952.1 | 950.7 | 945.9 | 933.9 | 914.7 | 891.7 | 872.8 | 832.1 |
| 27.5° | 960.5 | 964.1 | 985.9 | 1000.1 | 990.7 | 983.8 | 970.3 | 947.0 | 921.2 | 904.1 | 855.4 |
| 30° | 1015.8 | 1017.2 | 1035.8 | 1049.9 | 1035.4 | 1025.9 | 1009.6 | 984.5 | 961.2 | 948.5 | 890.3 |
| 32.5° | 1069.2 | 1070.7 | 1086.7 | 1094.7 | 1079.4 | 1072.5 | 1058.3 | 1031.8 | 1015.4 | 1008.5 | 942.3 |
| 35° | 1125.6 | 1125.2 | 1138.3 | 1145.2 | 1129.6 | 1126.7 | 1112.1 | 1091.8 | 1088.9 | 1098.0 | 1018.3 |
| 37.5° | 1182.0 | 1178.7 | 1185.6 | 1194.7 | 1186.0 | 1188.9 | 1179.4 | 1172.5 | 1183.8 | 1207.4 | 1119.4 |
| 40° | 1227.1 | 1227.1 | 1234.3 | 1245.6 | 1248.5 | 1261.2 | 1255.8 | 1264.9 | 1301.2 | 1357.6 | 1244.5 |
| 42.5° | 1267.1 | 1267.4 | 1282.7 | 1300.2 | 1321.3 | 1340.9 | 1345.3 | 1368.9 | 1444.2 | 1532.5 | 1401.6 |
| 45° | 1308.9 | 1309.2 | 1330.0 | 1355.4 | 1400.2 | 1437.6 | 1446.4 | 1499.5 | 1607.1 | 1714.8 | 1572.2 |
| 47.5° | 1357.3 | 1353.3 | 1382.0 | 1424.5 | 1488.2 | 1542.0 | 1564.6 | 1639.8 | 1775.9 | 1908.2 | 1732.9 |
| 50° | 1411.8 | 1403.4 | 1435.4 | 1508.9 | 1587.5 | 1661.3 | 1699.1 | 1785.3 | 1957.0 | 2086.8 | 1884.2 |
| 52.5° | 1473.3 | 1468.5 | 1502.0 | 1591.5 | 1711.5 | 1796.6 | 1847.9 | 1961.0 | 2133.0 | 2264.6 | 2004.2 |
| 55° | 1549.6 | 1538.4 | 1586.7 | 1700.6 | 1857.0 | 1965.3 | 2026.1 | 2134.8 | 2325.4 | 2426.1 | 2095.9 |
| 57.5° | 1633.3 | 1620.9 | 1685.7 | 1836.9 | 2046.1 | 2165.0 | 2241.0 | 2330.5 | 2506.5 | 2549.8 | 2149.7 |
| 60° | 1723.5 | 1719.5 | 1796.2 | 1997.0 | 2271.5 | 2409.7 | 2464.7 | 2545.8 | 2664.0 | 2621.4 | 2136.3 |
| 62.5° | 1806.0 | 1804.6 | 1916.2 | 2170.4 | 2510.5 | 2662.5 | 2706.1 | 2727.6 | 2777.4 | 2616.7 | 2029.3 |
| 65° | 1893.0 | 1905.3 | 2056.2 | 2371.6 | 2784.3 | 2933.4 | 2951.6 | 2897.1 | 2815.6 | 2492.7 | 1810.4 |
| 67.5° | 1903.9 | 1927.9 | 2144.3 | 2559.9 | 3044.0 | 3184.7 | 3170.2 | 2961.4 | 2702.9 | 2147.5 | 1419.1 |
| 70° | 1702.8 | 1744.6 | 2003.9 | 2588.7 | 3226.9 | 3330.6 | 3225.5 | 2822.9 | 2293.7 | 1555.8 | 892.5 |
| 72.5° | 1422.7 | 1458.7 | 1687.8 | 2207.5 | 2990.9 | 3122.9 | 2980.7 | 2389.4 | 1620.9 | 892.5 | 454.6 |
| 75° | 1107.4 | 1149.2 | 1360.5 | 1754.8 | 2239.2 | 2291.9 | 2220.6 | 1666.4 | 891.0 | 368.0 | 206.6 |
| 77.5° | 675.7 | 705.9 | 870.3 | 1188.9 | 1566.7 | 1487.8 | 1260.9 | 934.3 | 391.0 | 176.4 | 127.7 |
| 80° | 298.9 | 317.5 | 428.8 | 638.6 | 905.2 | 855.7 | 674.6 | 399.0 | 213.8 | 112.0 | 89.1 |
| 82.5° | 160.4 | 172.4 | 211.3 | 252.8 | 397.5 | 415.7 | 337.1 | 229.8 | 114.9 | 64.0 | 50.9 |
| 85° | 70.6 | 77.5 | 96.0 | 91.6 | 130.6 | 128.4 | 129.5 | 157.8 | 54.9 | 29.5 | 33.1 |
| 87.5° | 0.0 | 0.0 | 0.0 | 0.0 | 0.4 | 0.4 | 4.0 | 21.1 | 5.5 | 8.7 | 7.6 |
| 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: P631988
 CATALOG NUMBER: GWS-SA2B-827-U-SL4-W

CANDELA DISTRIBUTION (continued):

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|-------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0° | 827.4 | 827.4 | 827.4 | 827.4 | 827.4 | 827.4 | 827.4 | 827.4 | 827.4 | 827.4 | 827.4 |
| 2.5° | 818.6 | 812.1 | 810.3 | 808.1 | 804.1 | 797.2 | 792.1 | 786.3 | 783.7 | 780.8 | 781.2 |
| 5° | 798.3 | 790.3 | 782.6 | 772.8 | 760.5 | 746.6 | 737.2 | 726.3 | 720.5 | 715.0 | 716.4 |
| 7.5° | 780.8 | 768.5 | 752.8 | 732.1 | 709.9 | 685.2 | 665.2 | 649.5 | 639.0 | 631.7 | 635.3 |
| 10° | 769.9 | 755.4 | 728.1 | 694.3 | 656.8 | 619.0 | 590.3 | 563.3 | 546.6 | 533.5 | 532.8 |
| 12.5° | 767.7 | 748.8 | 709.2 | 660.1 | 605.9 | 555.3 | 513.2 | 476.8 | 454.6 | 438.2 | 444.4 |
| 15° | 769.9 | 745.9 | 692.8 | 628.4 | 560.1 | 491.7 | 439.3 | 397.5 | 371.0 | 356.0 | 355.0 |
| 17.5° | 772.5 | 743.0 | 674.3 | 594.3 | 512.1 | 433.9 | 373.1 | 328.8 | 301.5 | 286.6 | 286.9 |
| 20° | 774.6 | 738.6 | 652.4 | 556.8 | 463.3 | 380.0 | 317.1 | 274.9 | 250.6 | 239.7 | 241.5 |
| 22.5° | 778.3 | 734.3 | 629.2 | 516.8 | 413.5 | 328.0 | 272.8 | 238.6 | 224.0 | 216.8 | 217.1 |
| 25° | 785.2 | 731.7 | 605.2 | 473.1 | 364.4 | 286.6 | 242.2 | 219.3 | 210.2 | 205.8 | 205.5 |
| 27.5° | 799.4 | 733.9 | 580.1 | 431.0 | 320.0 | 254.9 | 222.6 | 207.7 | 201.5 | 198.6 | 198.2 |
| 30° | 823.0 | 742.6 | 558.2 | 388.0 | 281.9 | 230.2 | 209.1 | 200.0 | 196.4 | 193.8 | 193.5 |
| 32.5° | 859.0 | 759.0 | 534.6 | 348.0 | 250.9 | 212.0 | 198.6 | 193.8 | 191.3 | 189.8 | 189.8 |
| 35° | 913.6 | 788.8 | 511.3 | 313.1 | 226.9 | 197.8 | 190.2 | 188.4 | 186.2 | 185.5 | 186.2 |
| 37.5° | 992.1 | 836.5 | 490.2 | 282.6 | 209.8 | 186.9 | 181.1 | 181.8 | 180.0 | 181.1 | 182.2 |
| 40° | 1091.8 | 900.1 | 472.4 | 257.5 | 197.1 | 178.9 | 173.1 | 175.7 | 174.6 | 175.7 | 177.5 |
| 42.5° | 1218.0 | 979.0 | 459.0 | 237.8 | 188.0 | 172.4 | 166.9 | 169.5 | 168.7 | 170.2 | 172.0 |
| 45° | 1358.7 | 1083.0 | 452.8 | 224.0 | 181.5 | 167.7 | 161.8 | 163.7 | 162.9 | 164.0 | 165.8 |
| 47.5° | 1493.6 | 1177.6 | 458.2 | 216.0 | 176.0 | 163.7 | 157.5 | 158.2 | 157.8 | 157.5 | 158.6 |
| 50° | 1610.0 | 1252.9 | 473.9 | 213.5 | 172.4 | 159.7 | 153.8 | 154.2 | 153.1 | 150.9 | 151.7 |
| 52.5° | 1704.9 | 1313.2 | 483.3 | 213.5 | 170.6 | 155.3 | 149.8 | 150.2 | 148.0 | 145.1 | 145.5 |
| 55° | 1767.5 | 1337.6 | 475.7 | 213.1 | 169.8 | 151.7 | 145.8 | 146.2 | 144.0 | 140.4 | 140.7 |
| 57.5° | 1785.3 | 1314.0 | 443.7 | 209.1 | 169.1 | 148.7 | 141.8 | 142.6 | 141.1 | 137.1 | 137.1 |
| 60° | 1735.5 | 1227.4 | 385.1 | 200.0 | 167.3 | 146.9 | 138.9 | 140.0 | 139.3 | 135.3 | 135.3 |
| 62.5° | 1604.9 | 1073.6 | 315.3 | 186.2 | 162.2 | 144.7 | 136.4 | 138.6 | 140.4 | 138.2 | 137.8 |
| 65° | 1360.5 | 860.1 | 256.4 | 170.9 | 155.7 | 141.1 | 132.7 | 138.2 | 142.2 | 145.1 | 145.1 |
| 67.5° | 1020.9 | 615.7 | 209.1 | 154.9 | 145.8 | 133.8 | 128.0 | 133.1 | 136.0 | 137.8 | 138.9 |
| 70° | 622.3 | 362.2 | 164.7 | 136.4 | 131.7 | 122.9 | 118.6 | 113.5 | 109.5 | 108.7 | 109.1 |
| 72.5° | 304.4 | 207.3 | 133.8 | 116.0 | 112.4 | 104.4 | 94.6 | 92.4 | 90.6 | 89.5 | 89.1 |
| 75° | 167.7 | 144.4 | 110.6 | 96.4 | 89.8 | 80.0 | 77.8 | 74.2 | 73.5 | 72.0 | 72.4 |
| 77.5° | 118.6 | 113.8 | 91.3 | 78.2 | 68.4 | 63.3 | 64.4 | 61.8 | 61.8 | 60.7 | 60.4 |
| 80° | 89.1 | 89.5 | 70.2 | 57.1 | 50.6 | 48.7 | 49.8 | 49.8 | 49.1 | 48.7 | 48.4 |
| 82.5° | 56.4 | 63.6 | 47.3 | 36.7 | 36.0 | 36.4 | 36.0 | 35.6 | 36.4 | 35.3 | 34.9 |
| 85° | 38.9 | 45.8 | 28.7 | 21.8 | 21.8 | 21.5 | 22.2 | 21.8 | 22.5 | 21.5 | 21.5 |
| 87.5° | 8.7 | 20.4 | 10.5 | 6.5 | 6.9 | 6.5 | 6.9 | 7.3 | 8.0 | 8.4 | 8.4 |
| 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

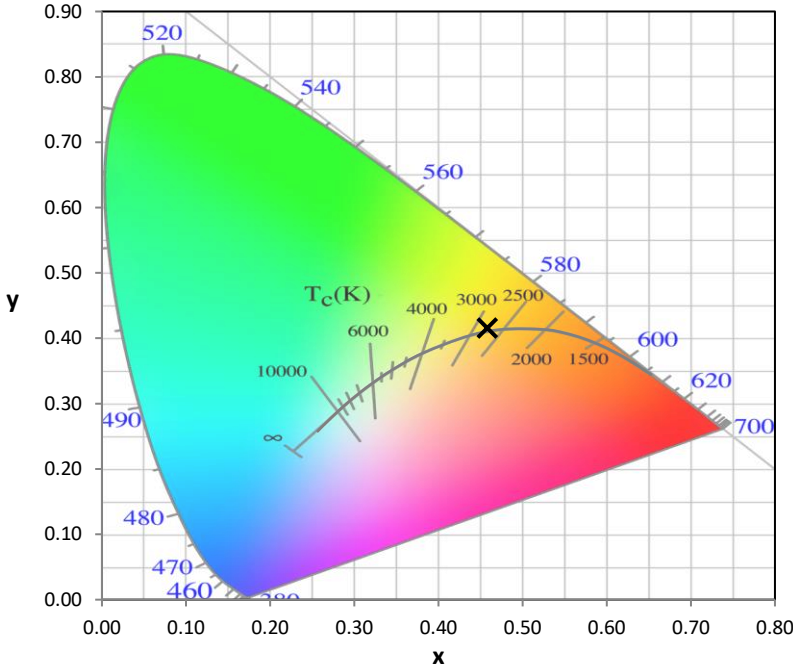
Stabilization Time: 81M
 Operation Time: 2H 21M
 Sphere Temperature (°C): 25.2

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

REPORT NUMBER: SP1-2407-157-9

Photopic Flux vs. Wavelength



Photopic Lumens: 4337.9

| 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 | 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 ($\mu\text{W}/\text{nm}$) | 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 | 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)