

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: P631682

Luminaire Tested: GWS-SA2B-727-U-T3R-W-HSS

Issue Date: 1/10/2023

Test Information

Test Method: LM-79-2019
Report Number: P631682
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2209-782-18)
Test Lab: COOPER LIGHTING SOLUTIONS
Issue Date: 1/10/2023
Manufacturer: COOPER LIGHTING SOLUTIONS
Product Line: McGRAW-EDISON
Catalog Number: GWS-SA2B-727-U-T3R-W-HSS
Description: GALLEON WALL SLIM LUMINAIRE. (2) LIGHTSQUARES WITH 16 LEDS EACH AND TYPE III ROADWAY OPTICS WITH HOUSE SIDE SHIELD
Light Source: (32) 2700K CCT, 70 CRI LEDS
Ballast/Driver: -

Summary

Lumens per Lamp: N/A
Luminaire Lumens: 4518 lumens
Efficiency: N/A
Efficacy: 97.4 lumens/watt
Luminous Opening: Rectangular (W 1' x L: 0.5' x H: 0')
IES Classification: Type III - Medium
BUG Rating: B1 - U0 - G1

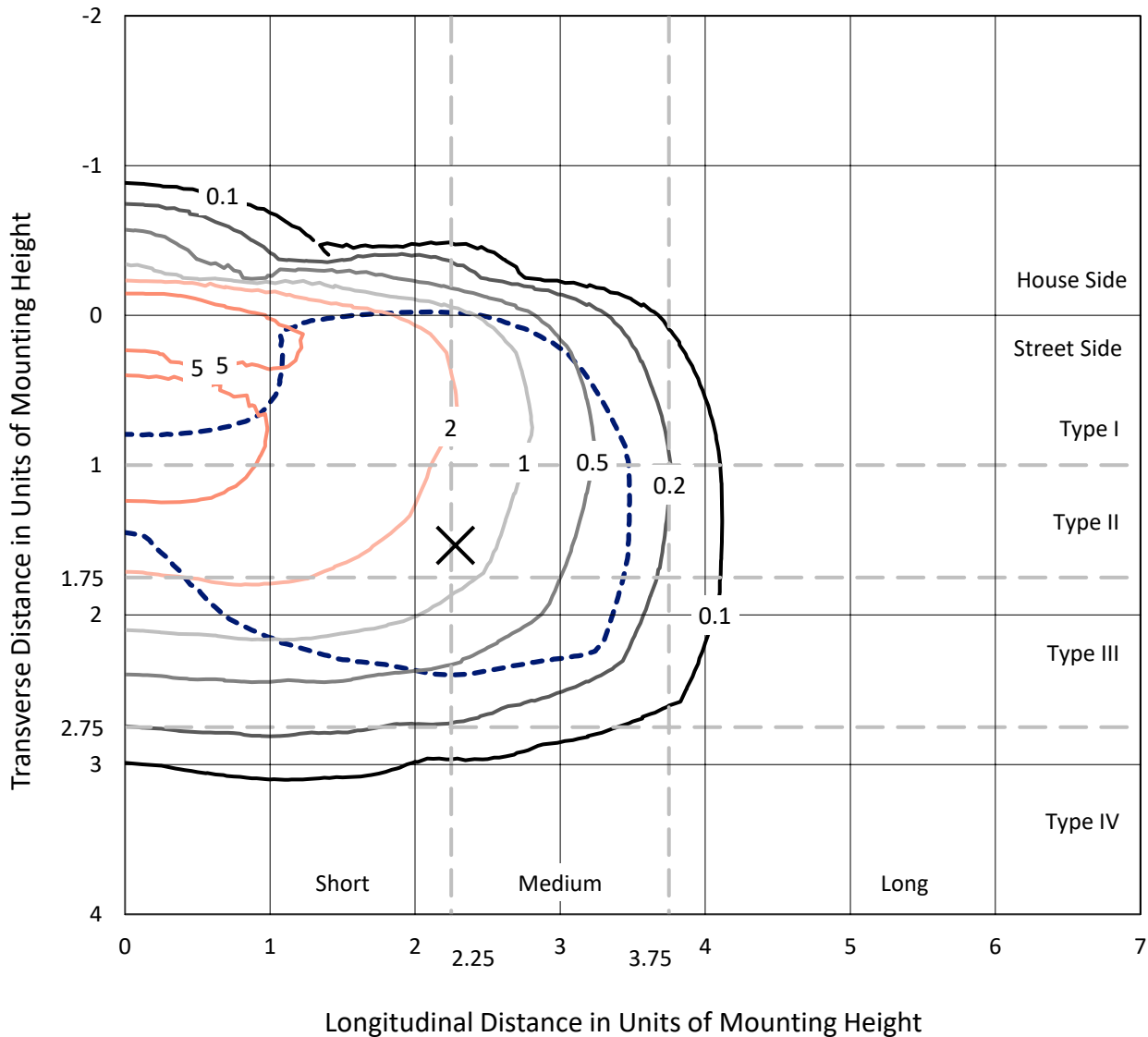
Input Watts (W): 46.4
Input Voltage (V): 120
Input Current (Ain): NR
Voltage Rise (V): NR
Power Factor: NR
Total Harmonic Distortion (THDi): NR
Frequency (hertz): 0
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 28.75 FT



REPORT NUMBER: P631682
 CATALOG NUMBER: GWS-SA2B-727-U-T3R-W-HSS

Iso-Footcandle Lines of Horizontal Illumination

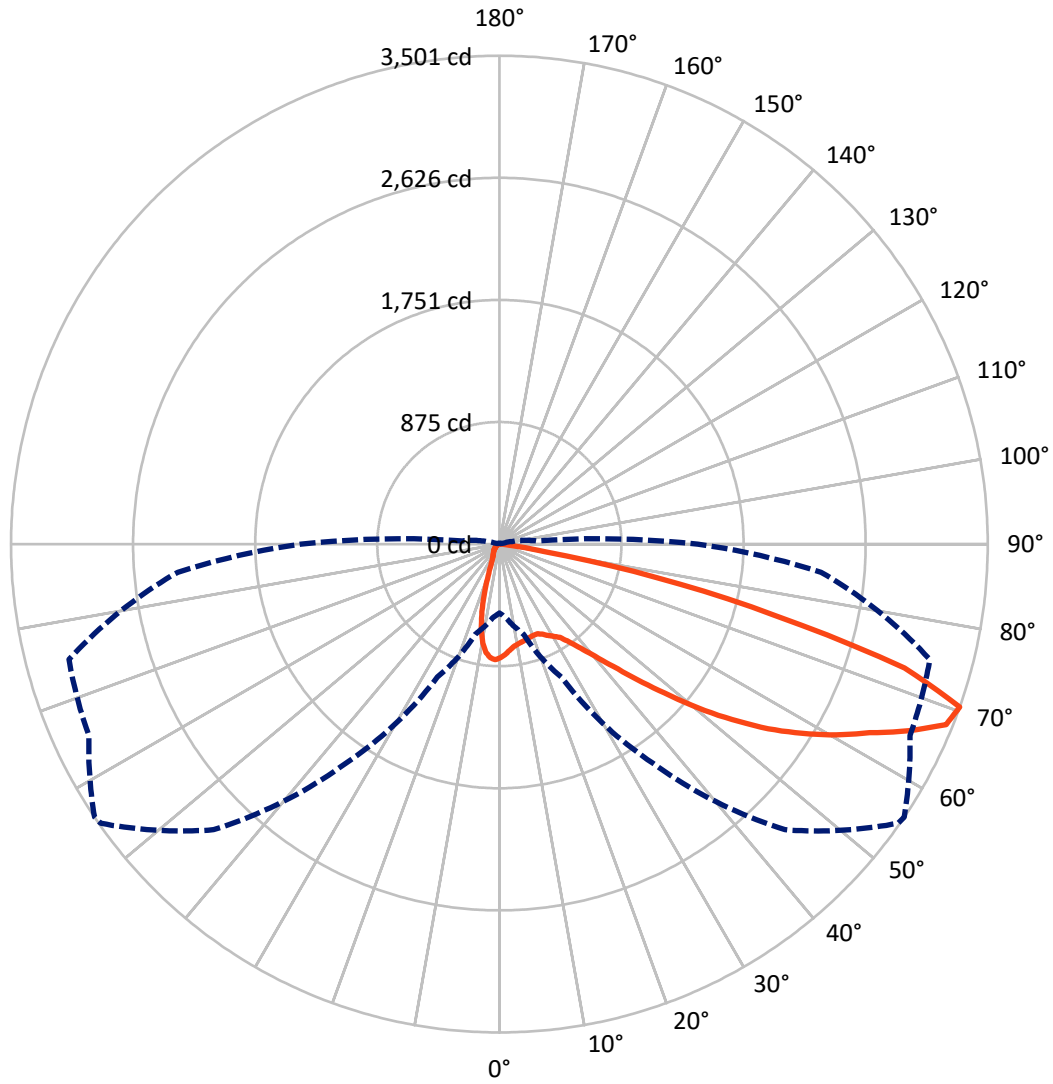
✕ Max cd
 - - - 1/2 Max cd



Based on 10 foot mounting height. Maximum calculated value = 8.6 fc
 Type III - Medium - N/A

REPORT NUMBER: P631682
CATALOG NUMBER: GWS-SA2B-727-U-T3R-W-HSS

Luminous Intensity Polar Plot



— Vertical Plane Through 56-Deg Lateral - - - Horizontal Cone Through 70-Deg Vertical

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FLUX DISTRIBUTION:

| | | Downward | Upward | Total |
|--------------------|-----------|----------|--------|--------|
| House Side | Lumens | 405.8 | 0.0 | 405.8 |
| | % Fixture | 9.0 | 0.0 | 9.0 |
| Street Side | Lumens | 4112.2 | 0.0 | 4112.2 |
| | % Fixture | 91.0 | 0.0 | 91.0 |
| Total | Lumens | 4518.0 | 0.0 | 4518.0 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

ZONAL LUMENS:

| Zone | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10° | 69.9 | 1.5 |
| 10°-20° | 157.3 | 3.5 |
| 20°-30° | 249.2 | 5.5 |
| 30°-40° | 429.7 | 9.5 |
| 40°-50° | 725.6 | 16.1 |
| 50°-60° | 1066.2 | 23.6 |
| 60°-70° | 1264.0 | 28.0 |
| 70°-80° | 539.0 | 11.9 |
| 80°-90° | 16.9 | 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° | 4518.0 | 100.0 |
| 0°-180° | 4518.0 | 100.0 |

Coefficient of Utilization



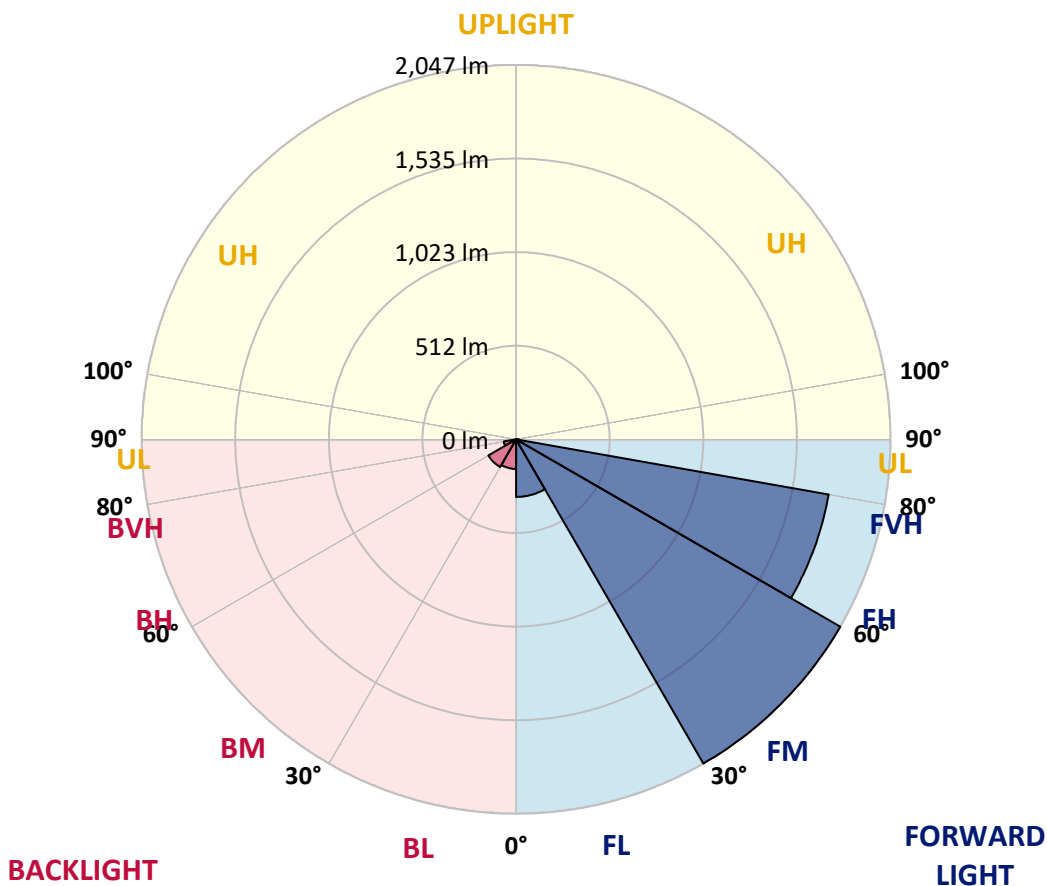
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LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | Lumens | % Fixture | Zone Rating/Lumen Limit | | |
|----------------|--------|-----------|-------------------------|------|---------|
| | | | B | U | G |
| FL (0°-30°) | 314.8 | 7.0 | | | |
| FM (30°-60°) | 2046.8 | 45.3 | | | |
| FH (60°-80°) | 1735.4 | 38.4 | | | G1/1800 |
| FVH (80°-90°) | 15.2 | 0.3 | | | G1/100 |
| BL (0°-30°) | 161.6 | 3.6 | B1/500 | | |
| BM (30°-60°) | 174.8 | 3.9 | B0/220 | | |
| BH (60°-80°) | 67.7 | 1.5 | B0/110 | | G0/110 |
| BVH (80°-90°) | 1.7 | 0.0 | | | G0/10 |
| UL (90°-100°) | 0.0 | 0.0 | | U0/0 | |
| UH (100°-180°) | 0.0 | 0.0 | | U0/0 | |

BUG Rating: B1-U0-G1
 Type III Medium





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CANDELA DISTRIBUTION (FULL):

| | 0° | 5° | 15° | 25° | 35° | 45° | 55° | 56° | 65° | 75° | 85° |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0° | 814.6 | 814.6 | 814.6 | 814.6 | 814.6 | 814.6 | 814.6 | 814.6 | 814.6 | 814.6 | 814.6 |
| 2.5° | 758.4 | 757.1 | 758.0 | 764.2 | 775.7 | 781.1 | 790.2 | 791.9 | 799.3 | 808.8 | 812.6 |
| 5° | 709.1 | 705.0 | 707.1 | 715.8 | 729.0 | 743.9 | 760.9 | 765.4 | 784.0 | 805.1 | 820.8 |
| 7.5° | 664.0 | 659.5 | 664.5 | 678.1 | 696.7 | 712.9 | 738.1 | 741.0 | 770.8 | 808.0 | 836.6 |
| 10° | 593.3 | 594.5 | 604.5 | 628.5 | 657.0 | 690.5 | 724.4 | 728.6 | 765.4 | 817.5 | 861.8 |
| 12.5° | 539.1 | 536.2 | 547.0 | 574.3 | 614.4 | 663.2 | 714.1 | 719.5 | 765.8 | 832.0 | 894.1 |
| 15° | 513.9 | 513.0 | 517.6 | 537.4 | 576.3 | 633.8 | 704.6 | 711.6 | 771.2 | 845.3 | 924.7 |
| 17.5° | 514.7 | 513.4 | 513.0 | 524.6 | 553.6 | 611.9 | 694.2 | 703.3 | 775.7 | 859.7 | 957.0 |
| 20° | 550.7 | 544.9 | 534.5 | 529.2 | 546.5 | 597.8 | 687.2 | 697.6 | 782.4 | 875.0 | 991.3 |
| 22.5° | 626.0 | 628.0 | 600.3 | 571.4 | 563.1 | 599.5 | 686.4 | 698.4 | 796.9 | 899.0 | 1033.5 |
| 25° | 776.6 | 773.3 | 722.0 | 657.0 | 611.9 | 618.5 | 700.9 | 715.3 | 825.4 | 933.4 | 1073.2 |
| 27.5° | 965.2 | 968.1 | 897.8 | 794.4 | 700.0 | 657.8 | 727.3 | 741.8 | 858.5 | 954.9 | 1099.7 |
| 30° | 1170.9 | 1168.0 | 1092.7 | 978.1 | 825.0 | 723.2 | 753.8 | 766.6 | 875.0 | 966.5 | 1127.0 |
| 32.5° | 1365.3 | 1358.7 | 1284.2 | 1164.2 | 984.3 | 826.2 | 790.2 | 797.7 | 897.0 | 991.7 | 1163.8 |
| 35° | 1531.2 | 1530.8 | 1465.9 | 1338.0 | 1148.1 | 955.3 | 852.7 | 858.9 | 937.9 | 1031.9 | 1218.0 |
| 37.5° | 1702.5 | 1696.7 | 1623.9 | 1507.2 | 1316.5 | 1096.8 | 948.3 | 945.8 | 1002.5 | 1091.0 | 1284.6 |
| 40° | 1843.2 | 1839.5 | 1783.6 | 1671.5 | 1491.5 | 1253.2 | 1064.1 | 1056.7 | 1079.0 | 1172.9 | 1377.3 |
| 42.5° | 1947.4 | 1947.9 | 1930.5 | 1862.2 | 1676.9 | 1434.0 | 1209.8 | 1198.2 | 1197.8 | 1296.6 | 1499.8 |
| 45° | 2026.5 | 2031.8 | 2057.9 | 2047.6 | 1895.7 | 1644.6 | 1396.3 | 1384.4 | 1364.1 | 1457.2 | 1640.0 |
| 47.5° | 2063.3 | 2070.3 | 2148.9 | 2190.3 | 2087.3 | 1853.5 | 1618.5 | 1593.3 | 1553.6 | 1670.7 | 1796.8 |
| 50° | 2059.6 | 2072.0 | 2181.6 | 2307.4 | 2261.1 | 2065.4 | 1860.6 | 1848.6 | 1783.6 | 1896.6 | 1952.0 |
| 52.5° | 1975.2 | 2001.6 | 2183.7 | 2378.6 | 2394.7 | 2260.6 | 2110.9 | 2088.5 | 2057.1 | 2132.4 | 2097.6 |
| 55° | 1746.0 | 1778.2 | 2096.4 | 2401.3 | 2498.9 | 2431.1 | 2355.8 | 2337.6 | 2285.5 | 2355.0 | 2224.6 |
| 57.5° | 1621.4 | 1649.1 | 1912.7 | 2390.1 | 2587.5 | 2588.7 | 2573.8 | 2558.9 | 2515.9 | 2575.1 | 2373.6 |
| 60° | 1546.5 | 1574.3 | 1814.6 | 2349.2 | 2667.8 | 2755.1 | 2778.6 | 2777.0 | 2714.9 | 2825.4 | 2548.2 |
| 62.5° | 1436.9 | 1475.0 | 1712.4 | 2242.8 | 2724.8 | 2918.9 | 2990.1 | 2978.9 | 2909.8 | 3086.0 | 2721.1 |
| 65° | 1215.5 | 1248.6 | 1503.1 | 2067.4 | 2691.3 | 3054.6 | 3219.3 | 3225.1 | 3145.2 | 3331.4 | 2857.7 |
| 67.5° | 852.3 | 876.7 | 1129.5 | 1699.2 | 2463.8 | 3099.3 | 3453.8 | 3453.4 | 3317.3 | 3457.2 | 2797.3 |
| 70° | 494.0 | 527.5 | 667.4 | 1050.5 | 1916.8 | 2896.1 | 3489.0 | 3501.0 | 3247.4 | 3194.4 | 2314.8 |
| 72.5° | 191.1 | 218.9 | 378.2 | 558.1 | 999.6 | 2218.4 | 3001.2 | 3036.4 | 2717.8 | 2464.2 | 1611.1 |
| 75° | 57.1 | 63.7 | 177.9 | 297.1 | 401.3 | 1071.6 | 2031.8 | 2041.8 | 1864.3 | 1537.0 | 825.8 |
| 77.5° | 42.6 | 47.2 | 77.8 | 150.2 | 140.7 | 324.8 | 1051.3 | 1148.1 | 989.7 | 549.0 | 227.6 |
| 80° | 29.0 | 34.3 | 55.4 | 73.2 | 52.1 | 86.5 | 295.4 | 324.4 | 302.0 | 123.3 | 57.1 |
| 82.5° | 12.8 | 16.5 | 39.3 | 36.8 | 19.0 | 24.8 | 91.0 | 96.8 | 62.5 | 37.2 | 19.9 |
| 85° | 1.2 | 1.7 | 14.9 | 16.1 | 7.0 | 5.8 | 19.0 | 19.0 | 13.7 | 12.8 | 8.3 |
| 87.5° | 0.0 | 0.0 | 0.4 | 0.8 | 0.8 | 1.2 | 1.7 | 2.1 | 2.5 | 3.3 | 4.1 |
| 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: P631682

CATALOG NUMBER: GWS-SA2B-727-U-T3R-W-HSS

CANDELA DISTRIBUTION (continued):

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|-------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0° | 814.6 | 814.6 | 814.6 | 814.6 | 814.6 | 814.6 | 814.6 | 814.6 | 814.6 | 814.6 | 814.6 |
| 2.5° | 822.1 | 817.1 | 823.3 | 828.3 | 829.5 | 820.4 | 815.1 | 807.2 | 805.5 | 806.0 | 803.9 |
| 5° | 833.3 | 830.8 | 835.3 | 829.9 | 815.9 | 789.4 | 766.6 | 741.4 | 727.8 | 719.9 | 719.1 |
| 7.5° | 853.9 | 852.7 | 847.7 | 823.3 | 779.5 | 720.7 | 664.0 | 608.6 | 574.3 | 561.8 | 559.8 |
| 10° | 884.6 | 882.1 | 861.8 | 803.9 | 710.4 | 597.4 | 502.3 | 422.8 | 374.4 | 360.4 | 343.0 |
| 12.5° | 919.7 | 914.8 | 870.5 | 762.1 | 606.1 | 449.7 | 331.0 | 242.0 | 200.2 | 187.8 | 187.8 |
| 15° | 953.7 | 942.9 | 865.5 | 693.0 | 477.9 | 292.5 | 184.9 | 139.8 | 127.0 | 123.7 | 123.7 |
| 17.5° | 988.4 | 967.7 | 846.1 | 598.7 | 330.2 | 172.9 | 123.3 | 114.6 | 112.9 | 113.4 | 113.8 |
| 20° | 1021.1 | 988.8 | 811.7 | 485.3 | 210.6 | 120.8 | 110.5 | 108.4 | 107.6 | 108.4 | 108.0 |
| 22.5° | 1056.7 | 1008.3 | 759.6 | 361.6 | 136.9 | 108.8 | 105.1 | 103.4 | 102.6 | 103.8 | 103.8 |
| 25° | 1091.8 | 1022.3 | 690.5 | 243.3 | 108.8 | 101.4 | 99.3 | 97.6 | 96.8 | 97.2 | 97.2 |
| 27.5° | 1110.0 | 1017.0 | 599.9 | 155.1 | 97.6 | 93.9 | 91.8 | 89.8 | 88.5 | 88.1 | 88.5 |
| 30° | 1122.5 | 1000.4 | 489.0 | 110.5 | 88.5 | 84.0 | 81.9 | 80.3 | 77.0 | 74.9 | 75.7 |
| 32.5° | 1141.9 | 983.9 | 368.6 | 92.7 | 81.1 | 74.1 | 70.7 | 66.6 | 62.1 | 60.0 | 60.0 |
| 35° | 1165.1 | 961.1 | 258.6 | 83.6 | 73.2 | 65.8 | 59.6 | 52.5 | 47.2 | 45.5 | 45.5 |
| 37.5° | 1195.7 | 939.6 | 172.1 | 77.4 | 66.6 | 58.8 | 50.1 | 41.8 | 36.0 | 35.2 | 34.8 |
| 40° | 1241.6 | 921.4 | 121.2 | 72.8 | 60.8 | 51.3 | 41.0 | 32.3 | 28.1 | 26.9 | 26.9 |
| 42.5° | 1301.2 | 902.8 | 96.0 | 68.3 | 55.9 | 44.3 | 32.7 | 25.7 | 22.3 | 21.5 | 21.1 |
| 45° | 1374.8 | 880.8 | 83.6 | 64.1 | 50.9 | 36.8 | 26.1 | 21.5 | 19.0 | 18.2 | 18.2 |
| 47.5° | 1454.7 | 851.0 | 77.8 | 58.8 | 45.1 | 29.8 | 21.9 | 18.6 | 17.4 | 17.0 | 16.5 |
| 50° | 1533.3 | 810.9 | 72.8 | 53.8 | 38.5 | 24.4 | 19.0 | 17.0 | 16.1 | 15.7 | 15.7 |
| 52.5° | 1602.0 | 764.2 | 66.6 | 48.0 | 31.4 | 21.1 | 17.0 | 15.7 | 14.9 | 14.1 | 13.7 |
| 55° | 1660.7 | 713.3 | 58.8 | 41.4 | 25.7 | 18.6 | 15.7 | 14.5 | 13.7 | 12.8 | 12.4 |
| 57.5° | 1736.4 | 684.3 | 47.2 | 33.5 | 21.1 | 16.5 | 14.5 | 13.2 | 12.4 | 11.2 | 11.2 |
| 60° | 1820.4 | 663.2 | 35.2 | 26.5 | 18.2 | 15.3 | 13.2 | 12.0 | 11.2 | 9.9 | 9.9 |
| 62.5° | 1887.9 | 631.8 | 27.7 | 21.5 | 15.7 | 13.7 | 12.0 | 10.8 | 9.9 | 8.7 | 8.7 |
| 65° | 1913.5 | 566.8 | 22.8 | 17.0 | 12.8 | 12.0 | 10.8 | 9.9 | 8.7 | 7.4 | 7.4 |
| 67.5° | 1797.7 | 436.9 | 19.0 | 13.7 | 10.8 | 10.3 | 9.5 | 9.1 | 7.4 | 6.6 | 6.2 |
| 70° | 1423.7 | 266.4 | 15.7 | 11.2 | 9.1 | 8.7 | 8.7 | 7.9 | 6.6 | 6.2 | 5.8 |
| 72.5° | 975.6 | 137.4 | 12.8 | 9.1 | 7.9 | 7.9 | 7.4 | 7.0 | 6.2 | 5.8 | 5.8 |
| 75° | 506.8 | 45.9 | 9.9 | 7.0 | 6.2 | 6.6 | 6.6 | 6.2 | 5.8 | 5.8 | 5.4 |
| 77.5° | 145.2 | 20.7 | 7.4 | 5.4 | 5.0 | 5.0 | 5.4 | 5.4 | 5.4 | 5.0 | 5.0 |
| 80° | 37.6 | 12.0 | 5.4 | 4.1 | 4.1 | 4.1 | 4.1 | 4.6 | 5.0 | 4.6 | 4.6 |
| 82.5° | 15.3 | 6.6 | 3.7 | 3.3 | 3.3 | 3.3 | 3.3 | 3.7 | 4.1 | 4.1 | 4.1 |
| 85° | 9.5 | 3.3 | 2.9 | 2.9 | 2.9 | 2.5 | 2.5 | 2.9 | 2.9 | 3.3 | 3.3 |
| 87.5° | 5.8 | 2.5 | 2.5 | 2.5 | 2.5 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 |
| 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

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

| Measurement and Test Equipment | | | |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument | Identification Number | Calibration Date | Calibration Due Date |
| Photometer | IN0058 | 6/28/2019 | 12/28/2019 |
| Power Meter | IN0071 | 12/5/2018 | 12/5/2019 |
| AC Power Source | IN0063 | 12/5/2018 | 12/5/2019 |
| DC Power Source | IN0208 | 12/5/2018 | 12/5/2019 |
| Sphere Thermometer | IN0085 | 12/5/2018 | 12/5/2019 |
| Room Thermometer | IN0046 | 12/5/2018 | 12/5/2019 |

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CIE 1931 Chromaticity Diagram



CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles



Point lies inside the ANSI 2700K 4-step quadrangle

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

Photopic Flux vs. Wavelength



Photopic Lumens: 6211.7

| 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 | 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 | | | |

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

Melanopic Flux vs. Wavelength



Melanopic Lumens: 2145.7 M/P: 0.35

| 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 | 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 | | | |

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

TM-30-18

Summary

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



Color Vector Graphics



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

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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)