

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: P642533

Luminaire Tested: GWS-SA6D-727-U-AFL-W-GRSWH

Issue Date: 1/10/2023

Test Information

Test Method: LM-79-2019
Report Number: P642533
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2209-782-47)
Test Lab: COOPER LIGHTING SOLUTIONS
Issue Date: 1/10/2023
Manufacturer: COOPER LIGHTING SOLUTIONS
Product Line: McGRAW-EDISON
Catalog Number: GWS-SA6D-727-U-AFL-W-GRSWH
Description: GALLEON WALL SLIM LUMINAIRE. (6) LIGHTSQUARES WITH 16 LEDS EACH AND AUTOMOTIVE FRONTLINE OPTICS W/ FACTORY INSTALLED GLARE SHIELD, WH
Light Source: (96) 2700K CCT, 70 CRI LEDS
Ballast/Driver: -

Summary

Lumens per Lamp: N/A
Luminaire Lumens: 27177.5 lumens
Efficiency: N/A
Efficacy: 110.6 lumens/watt
Luminous Opening: Rectangular (W 2' x L: 1' x H: 0')
IES Classification: Type II - Short
BUG Rating: B3 - U0 - G2

Input Watts (W): 245.7
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

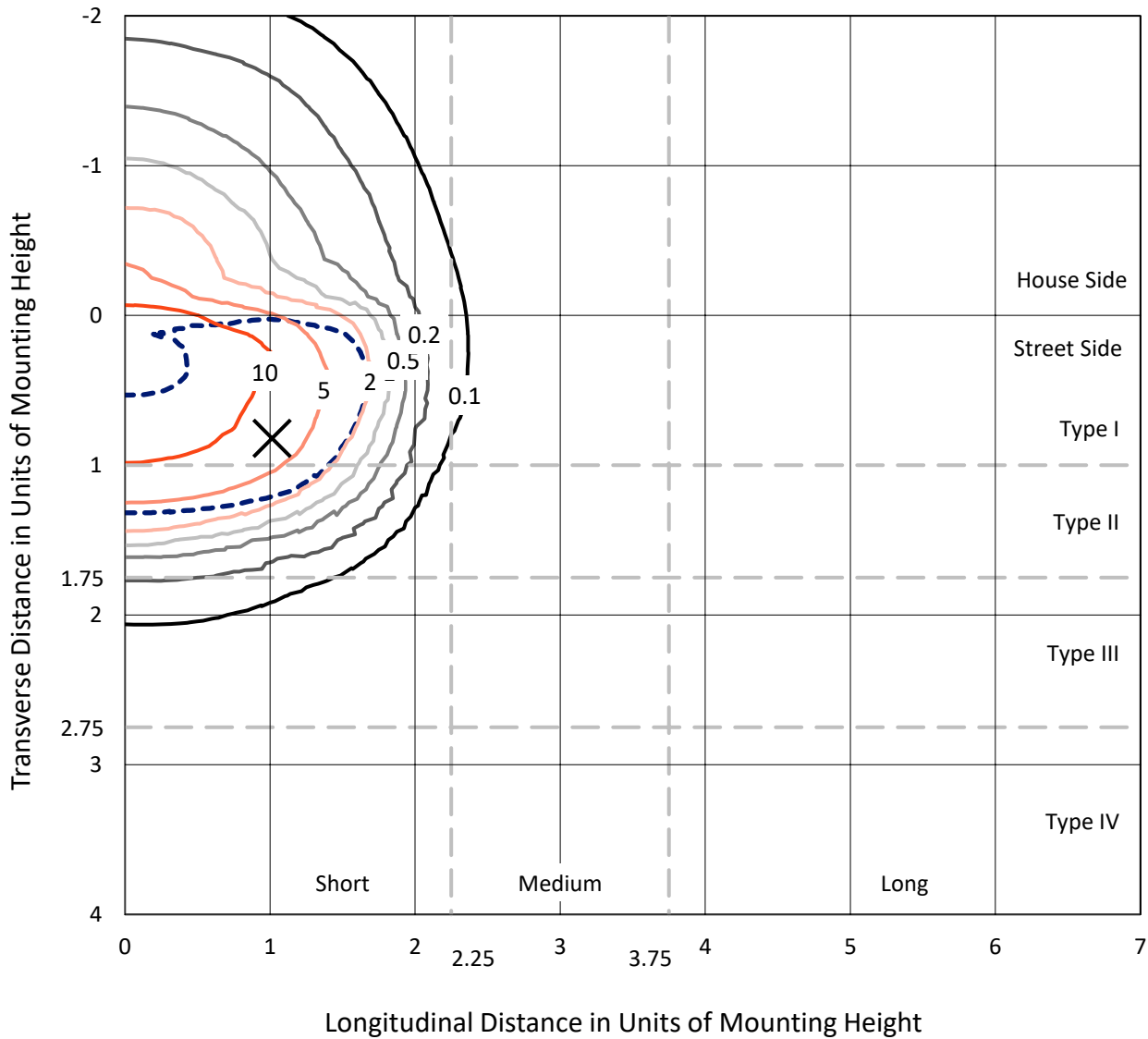


REPORT NUMBER: P642533

CATALOG NUMBER: GWS-SA6D-727-U-AFL-W-GRSWH

Iso-Footcandle Lines of Horizontal Illumination

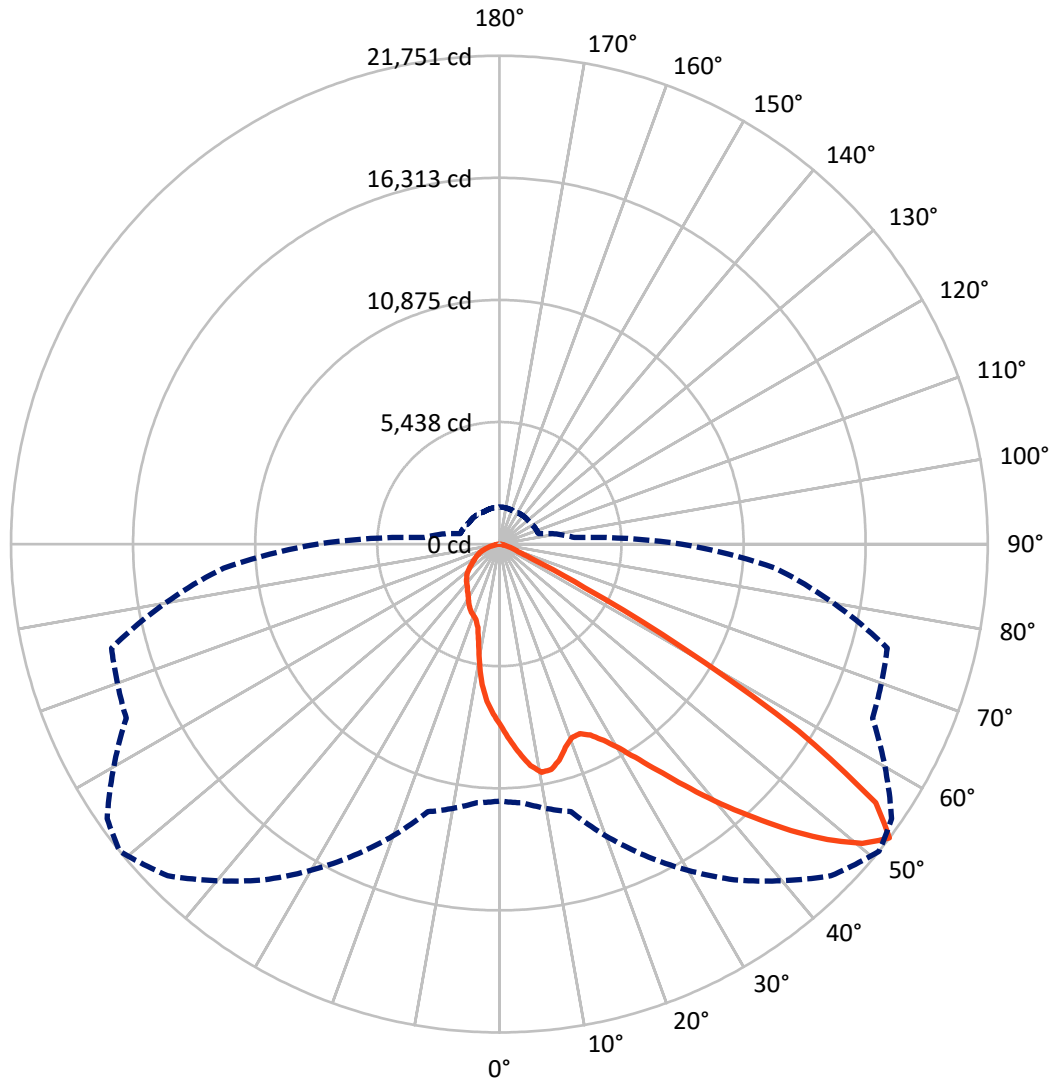
✕ Max cd
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 15.8 fc
 Type II - Short - N/A

REPORT NUMBER: P642533
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Luminous Intensity Polar Plot



— Vertical Plane Through 51-Deg Lateral - - - Horizontal Cone Through 52.5-Deg Vertical

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FLUX DISTRIBUTION:

| | | Downward | Upward | Total |
|--------------------|-----------|----------|--------|---------|
| House Side | Lumens | 5295.3 | 0.0 | 5295.3 |
| | % Fixture | 19.5 | 0.0 | 19.5 |
| Street Side | Lumens | 21882.2 | 0.0 | 21882.2 |
| | % Fixture | 80.5 | 0.0 | 80.5 |
| Total | Lumens | 27177.5 | 0.0 | 27177.5 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

ZONAL LUMENS:

| Zone | Lumens | % Fixture |
|-----------|---------|-----------|
| 0°-10° | 755.1 | 2.8 |
| 10°-20° | 1962.1 | 7.2 |
| 20°-30° | 3190.2 | 11.7 |
| 30°-40° | 5055.7 | 18.6 |
| 40°-50° | 7625.1 | 28.1 |
| 50°-60° | 6596.3 | 24.3 |
| 60°-70° | 1495.4 | 5.5 |
| 70°-80° | 440.9 | 1.6 |
| 80°-90° | 56.8 | 0.2 |
| 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° | 27177.5 | 100.0 |
| 0°-180° | 27177.5 | 100.0 |

Coefficient of Utilization



REPORT NUMBER: P642533

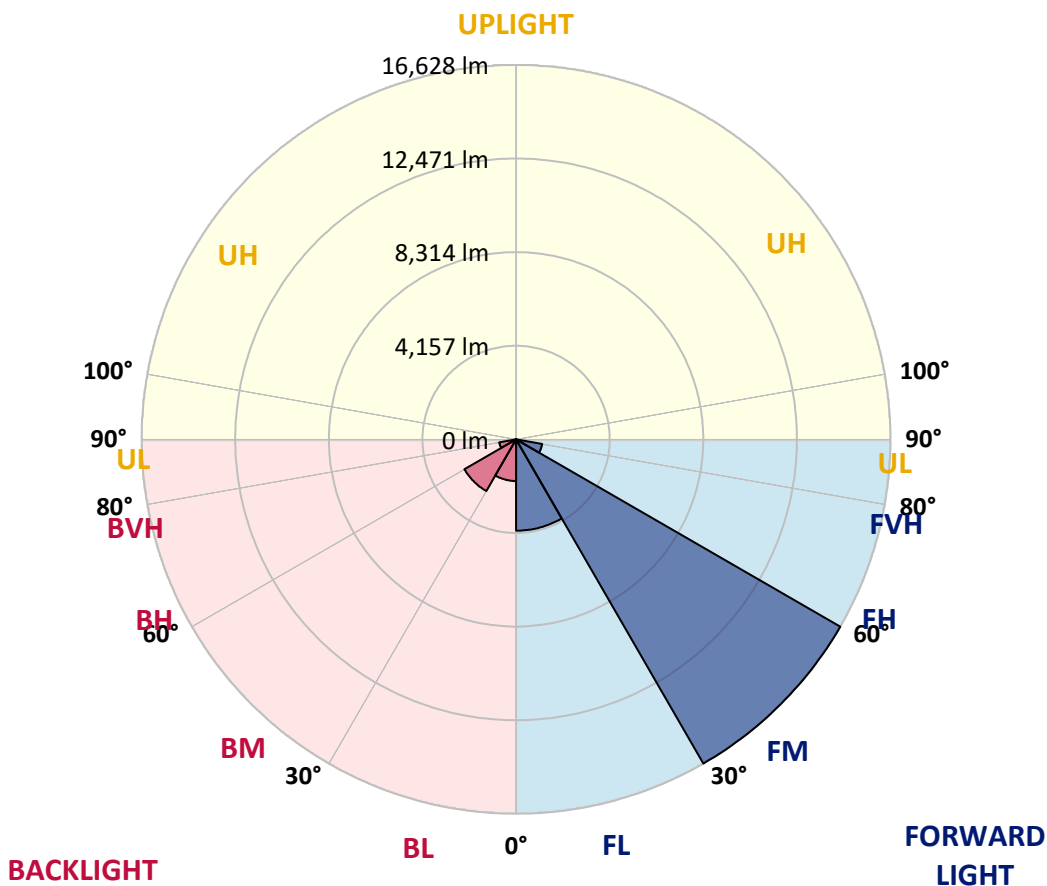
CATALOG NUMBER: GWS-SA6D-727-U-AFL-W-GRSWH

LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | Lumens | % Fixture | Zone Rating/Lumen Limit | | |
|----------------|---------|-----------|-------------------------|------|---------|
| | | | B | U | G |
| FL (0°-30°) | 4056.3 | 14.9 | | | |
| FM (30°-60°) | 16627.6 | 61.2 | | | |
| FH (60°-80°) | 1176.9 | 4.3 | | | G1/1800 |
| FVH (80°-90°) | 21.4 | 0.1 | | | G1/100 |
| BL (0°-30°) | 1851.0 | 6.8 | B3/2500 | | |
| BM (30°-60°) | 2649.4 | 9.7 | B3/5000 | | |
| BH (60°-80°) | 759.5 | 2.8 | B2/1000 | | G2/1000 |
| BVH (80°-90°) | 35.4 | 0.1 | | | G1/100 |
| UL (90°-100°) | 0.0 | 0.0 | | U0/0 | |
| UH (100°-180°) | 0.0 | 0.0 | | U0/0 | |

BUG Rating: B3-U0-G2

Type II Short





REPORT NUMBER: P642533

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CANDELA DISTRIBUTION (FULL):

| | 0° | 5° | 15° | 25° | 35° | 45° | 51° | 55° | 65° | 75° | 85° |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0° | 8092.1 | 8092.1 | 8092.1 | 8092.1 | 8092.1 | 8092.1 | 8092.1 | 8092.1 | 8092.1 | 8092.1 | 8092.1 |
| 2.5° | 9017.7 | 9069.2 | 8989.8 | 8959.7 | 8910.3 | 8824.4 | 8725.6 | 8697.7 | 8485.1 | 8345.5 | 8188.7 |
| 5° | 9924.0 | 9951.9 | 9887.5 | 9823.1 | 9700.6 | 9548.2 | 9357.0 | 9316.2 | 8929.7 | 8609.7 | 8276.8 |
| 7.5° | 10125.9 | 10115.1 | 10171.0 | 10207.5 | 10192.4 | 10132.3 | 9962.6 | 9883.2 | 9421.5 | 8914.6 | 8422.8 |
| 10° | 9327.0 | 9266.8 | 9473.0 | 9717.8 | 10012.0 | 10351.4 | 10332.0 | 10325.6 | 9924.0 | 9324.8 | 8609.7 |
| 12.5° | 8268.2 | 8238.1 | 8405.6 | 8712.7 | 9269.0 | 10020.6 | 10302.0 | 10521.0 | 10377.1 | 9715.7 | 8818.0 |
| 15° | 7662.6 | 7651.8 | 7765.7 | 7986.9 | 8429.3 | 9378.5 | 9979.8 | 10413.6 | 10765.8 | 10134.5 | 9039.2 |
| 17.5° | 7553.1 | 7559.5 | 7598.2 | 7724.9 | 8042.7 | 8824.4 | 9520.2 | 10125.9 | 11068.6 | 10594.0 | 9316.2 |
| 20° | 7873.0 | 7916.0 | 7849.4 | 7868.7 | 8040.6 | 8624.7 | 9206.7 | 9835.9 | 11261.9 | 11055.8 | 9614.7 |
| 22.5° | 8583.9 | 8568.9 | 8422.8 | 8336.9 | 8339.1 | 8747.1 | 9172.3 | 9700.6 | 11388.6 | 11504.6 | 9885.3 |
| 25° | 9389.2 | 9372.1 | 9198.1 | 9007.0 | 8886.7 | 9080.0 | 9419.3 | 9844.5 | 11502.5 | 11914.8 | 10102.2 |
| 27.5° | 10340.6 | 10286.9 | 10093.6 | 9848.8 | 9582.5 | 9666.3 | 9896.1 | 10233.2 | 11678.6 | 12318.5 | 10246.1 |
| 30° | 11261.9 | 11324.2 | 11047.2 | 10757.2 | 10475.9 | 10424.4 | 10557.5 | 10862.5 | 12037.2 | 12791.0 | 10417.9 |
| 32.5° | 12483.9 | 12462.4 | 12155.3 | 11777.4 | 11375.8 | 11337.1 | 11442.3 | 11721.5 | 12681.5 | 13443.9 | 10679.9 |
| 35° | 13963.6 | 13967.9 | 13531.9 | 13020.8 | 12449.5 | 12346.5 | 12522.6 | 12793.2 | 13641.5 | 14328.7 | 11094.4 |
| 37.5° | 15501.3 | 15494.8 | 15114.7 | 14534.9 | 13755.3 | 13609.2 | 13811.1 | 14013.0 | 14842.0 | 15533.5 | 11738.7 |
| 40° | 16579.4 | 16622.3 | 16444.1 | 16139.1 | 15400.3 | 15043.8 | 15222.1 | 15361.7 | 16147.7 | 16950.9 | 12587.0 |
| 42.5° | 17191.4 | 17255.8 | 17294.5 | 17477.0 | 17088.3 | 16708.2 | 16643.8 | 16716.8 | 17313.8 | 18267.4 | 13383.7 |
| 45° | 17322.4 | 17408.3 | 17689.7 | 18366.1 | 18516.5 | 18409.1 | 18198.6 | 18022.5 | 18183.6 | 19201.6 | 13905.6 |
| 47.5° | 16744.7 | 16895.0 | 17496.4 | 18679.7 | 19558.1 | 19895.2 | 19661.1 | 19392.7 | 18686.1 | 19442.1 | 13851.9 |
| 50° | 14455.4 | 14631.5 | 15986.6 | 18039.7 | 19706.2 | 20934.7 | 20956.1 | 20558.8 | 18626.0 | 18748.4 | 13177.6 |
| 52.5° | 11444.5 | 11564.7 | 12340.0 | 15292.9 | 18252.3 | 20891.7 | 21750.7 | 21325.5 | 18336.1 | 17880.8 | 12333.6 |
| 55° | 6840.1 | 7033.3 | 7757.1 | 10089.4 | 14219.2 | 18516.5 | 20346.2 | 20552.4 | 18194.3 | 17152.8 | 11758.0 |
| 57.5° | 2308.7 | 2403.1 | 3094.7 | 4456.2 | 8379.9 | 13557.7 | 15720.3 | 16557.9 | 16517.1 | 16040.3 | 10634.8 |
| 60° | 1099.6 | 1121.0 | 1260.6 | 1690.1 | 3354.5 | 7084.9 | 9305.5 | 10271.9 | 11152.4 | 11240.5 | 6616.7 |
| 62.5° | 837.6 | 850.4 | 921.3 | 1013.7 | 1348.7 | 2985.1 | 4265.1 | 5003.9 | 5345.3 | 4587.2 | 2409.6 |
| 65° | 700.1 | 710.9 | 764.5 | 822.5 | 917.0 | 1292.8 | 1636.5 | 1887.7 | 1700.9 | 1325.1 | 1149.0 |
| 67.5° | 584.1 | 592.7 | 633.5 | 695.8 | 760.2 | 865.5 | 908.4 | 934.2 | 979.3 | 1099.6 | 1056.6 |
| 70° | 457.4 | 466.0 | 509.0 | 562.7 | 624.9 | 650.7 | 691.5 | 717.3 | 807.5 | 962.1 | 957.8 |
| 72.5° | 352.2 | 362.9 | 386.6 | 420.9 | 472.5 | 498.2 | 543.3 | 573.4 | 624.9 | 749.5 | 801.0 |
| 75° | 257.7 | 264.2 | 285.6 | 296.4 | 302.8 | 296.4 | 341.5 | 375.8 | 444.5 | 491.8 | 504.7 |
| 77.5° | 105.2 | 118.1 | 113.8 | 113.8 | 135.3 | 163.2 | 186.8 | 208.3 | 255.6 | 283.5 | 285.6 |
| 80° | 43.0 | 47.2 | 55.8 | 62.3 | 75.2 | 96.6 | 111.7 | 120.3 | 141.7 | 158.9 | 171.8 |
| 82.5° | 25.8 | 27.9 | 32.2 | 34.4 | 43.0 | 55.8 | 64.4 | 70.9 | 88.1 | 105.2 | 111.7 |
| 85° | 12.9 | 12.9 | 15.0 | 17.2 | 21.5 | 25.8 | 30.1 | 34.4 | 45.1 | 55.8 | 62.3 |
| 87.5° | 2.1 | 2.1 | 2.1 | 4.3 | 6.4 | 8.6 | 10.7 | 12.9 | 15.0 | 17.2 | 21.5 |
| 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: P642533

CATALOG NUMBER: GWS-SA6D-727-U-AFL-W-GRSWH

CANDELA DISTRIBUTION (continued):

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0° | 8092.1 | 8092.1 | 8092.1 | 8092.1 | 8092.1 | 8092.1 | 8092.1 | 8092.1 | 8092.1 | 8092.1 | 8092.1 |
| 2.5° | 8096.4 | 7980.4 | 7845.1 | 7737.7 | 7613.2 | 7520.8 | 7389.8 | 7308.2 | 7230.9 | 7166.5 | 7119.2 |
| 5° | 8105.0 | 7909.6 | 7628.2 | 7379.1 | 7121.4 | 6876.6 | 6625.3 | 6421.3 | 6238.7 | 6086.3 | 6073.4 |
| 7.5° | 8154.4 | 7873.0 | 7432.8 | 6996.8 | 6494.3 | 6008.9 | 5523.6 | 5128.4 | 4827.8 | 4671.0 | 4638.8 |
| 10° | 8238.1 | 7868.7 | 7233.1 | 6537.2 | 5680.4 | 4898.6 | 4323.1 | 4022.4 | 3848.5 | 3786.2 | 3764.7 |
| 12.5° | 8326.2 | 7858.0 | 6977.5 | 5888.7 | 4698.9 | 4013.8 | 3698.1 | 3661.6 | 3693.8 | 3698.1 | 3696.0 |
| 15° | 8433.6 | 7851.6 | 6655.4 | 5128.4 | 3981.6 | 3603.6 | 3625.1 | 3702.4 | 3777.6 | 3794.8 | 3794.8 |
| 17.5° | 8564.6 | 7836.5 | 6217.3 | 4385.4 | 3532.8 | 3524.2 | 3638.0 | 3741.1 | 3812.0 | 3824.8 | 3824.8 |
| 20° | 8702.0 | 7797.9 | 5678.2 | 3779.7 | 3350.2 | 3474.8 | 3597.2 | 3676.7 | 3726.1 | 3743.2 | 3745.4 |
| 22.5° | 8796.5 | 7694.8 | 5057.6 | 3330.9 | 3236.4 | 3380.3 | 3468.3 | 3550.0 | 3550.0 | 3507.0 | 3494.1 |
| 25° | 8815.8 | 7473.6 | 4385.4 | 3023.8 | 3101.1 | 3234.3 | 3324.5 | 3277.2 | 3189.2 | 3154.8 | 3152.7 |
| 27.5° | 8745.0 | 7151.5 | 3721.8 | 2804.7 | 2937.9 | 3071.0 | 3056.0 | 2987.3 | 2948.6 | 2914.3 | 2927.2 |
| 30° | 8659.1 | 6764.9 | 3146.2 | 2624.3 | 2748.9 | 2879.9 | 2828.4 | 2804.7 | 2776.8 | 2738.2 | 2746.8 |
| 32.5° | 8601.1 | 6333.2 | 2703.8 | 2484.8 | 2622.2 | 2643.7 | 2680.2 | 2678.0 | 2652.3 | 2579.2 | 2575.0 |
| 35° | 8618.3 | 5897.3 | 2407.4 | 2370.9 | 2517.0 | 2508.4 | 2577.1 | 2564.2 | 2386.0 | 2285.0 | 2278.6 |
| 37.5° | 8755.7 | 5478.5 | 2233.5 | 2280.7 | 2349.5 | 2403.1 | 2463.3 | 2308.7 | 2246.4 | 2181.9 | 2186.2 |
| 40° | 9017.7 | 5089.8 | 2139.0 | 2231.3 | 2248.5 | 2328.0 | 2188.4 | 2186.2 | 2158.3 | 2100.3 | 2098.2 |
| 42.5° | 9314.1 | 4761.2 | 2074.6 | 2207.7 | 2184.1 | 2199.1 | 2050.9 | 2068.1 | 2066.0 | 2029.5 | 2018.7 |
| 45° | 9494.5 | 4458.4 | 2023.0 | 2119.7 | 2126.1 | 1975.8 | 1930.7 | 1950.0 | 1960.7 | 1941.4 | 1939.3 |
| 47.5° | 9307.6 | 4110.5 | 1969.3 | 1984.4 | 2040.2 | 1874.8 | 1819.0 | 1821.2 | 1840.5 | 1842.6 | 1834.0 |
| 50° | 8783.6 | 3721.8 | 1904.9 | 1868.4 | 1831.9 | 1769.6 | 1718.1 | 1707.3 | 1726.7 | 1746.0 | 1752.4 |
| 52.5° | 8107.1 | 3350.2 | 1797.5 | 1741.7 | 1655.8 | 1655.8 | 1632.2 | 1597.8 | 1623.6 | 1649.3 | 1657.9 |
| 55° | 7611.0 | 3075.3 | 1645.0 | 1582.8 | 1488.3 | 1520.5 | 1516.2 | 1486.1 | 1520.5 | 1539.8 | 1546.3 |
| 57.5° | 6595.2 | 2471.9 | 1447.5 | 1428.1 | 1348.7 | 1387.3 | 1395.9 | 1357.3 | 1340.1 | 1344.4 | 1350.8 |
| 60° | 3915.0 | 1595.7 | 1305.7 | 1303.6 | 1232.7 | 1277.8 | 1303.6 | 1264.9 | 1213.4 | 1219.8 | 1228.4 |
| 62.5° | 1756.7 | 1219.8 | 1127.5 | 1118.9 | 1116.7 | 1174.7 | 1202.6 | 1166.1 | 1093.1 | 1099.6 | 1108.2 |
| 65° | 1106.0 | 1054.5 | 979.3 | 979.3 | 1013.7 | 1063.1 | 1084.5 | 1054.5 | 970.7 | 960.0 | 968.6 |
| 67.5° | 1026.5 | 981.4 | 904.1 | 889.1 | 906.3 | 947.1 | 949.2 | 891.2 | 841.9 | 833.3 | 833.3 |
| 70° | 921.3 | 887.0 | 811.8 | 781.7 | 775.3 | 773.1 | 766.7 | 751.7 | 719.4 | 710.9 | 715.1 |
| 72.5° | 762.4 | 738.8 | 691.5 | 659.3 | 642.1 | 640.0 | 614.2 | 601.3 | 573.4 | 569.1 | 567.0 |
| 75° | 504.7 | 511.1 | 511.1 | 506.8 | 491.8 | 485.4 | 457.4 | 444.5 | 412.3 | 399.5 | 397.3 |
| 77.5° | 298.5 | 305.0 | 313.5 | 315.7 | 313.5 | 313.5 | 287.8 | 272.7 | 240.5 | 223.3 | 219.1 |
| 80° | 182.5 | 186.8 | 191.1 | 197.6 | 189.0 | 182.5 | 158.9 | 143.9 | 128.9 | 118.1 | 116.0 |
| 82.5° | 118.1 | 122.4 | 124.6 | 128.9 | 124.6 | 116.0 | 96.6 | 88.1 | 77.3 | 68.7 | 66.6 |
| 85° | 66.6 | 68.7 | 73.0 | 73.0 | 66.6 | 60.1 | 49.4 | 43.0 | 36.5 | 32.2 | 32.2 |
| 87.5° | 23.6 | 23.6 | 23.6 | 25.8 | 21.5 | 19.3 | 12.9 | 8.6 | 6.4 | 6.4 | 6.4 |
| 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 |

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

CIE 1931 Chromaticity Diagram



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



Point lies inside the ANSI 2700K 4-step quadrangle

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 $R_a = 71.5$
 $R_g = -16.1$



Color Vector Graphics



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

TM-30-18

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 | |



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

TM-30-18

Color Rendition by Hue-Angle Bin



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

TM-30-18

Measure Comparisons



(END OF REPORT)