

Scaled data based on original data using  
LM-79-08 Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Test Report Prepared for  
Cooper Lighting Solutions  
(formerly Eaton)

Brand: McGRAW-EDISON

Report Number: P319264

Luminaire Tested: **GLEON-SA0D-722-U-T4W**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P319264  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-18)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA0D-722-U-T4W  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(10) 70 CRI, 2200K, 1200mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE IV  
WIDE OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 56062 lumens  
Efficiency: N/A  
Efficacy: 87.6 lumens/watt  
Luminous Opening: Rectangular (W 2.5' x L: 1' x H: 0')  
IES Classification: Type IV - Short  
BUG Rating: B4 - U0 - G5

Input Watts (W): 640  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

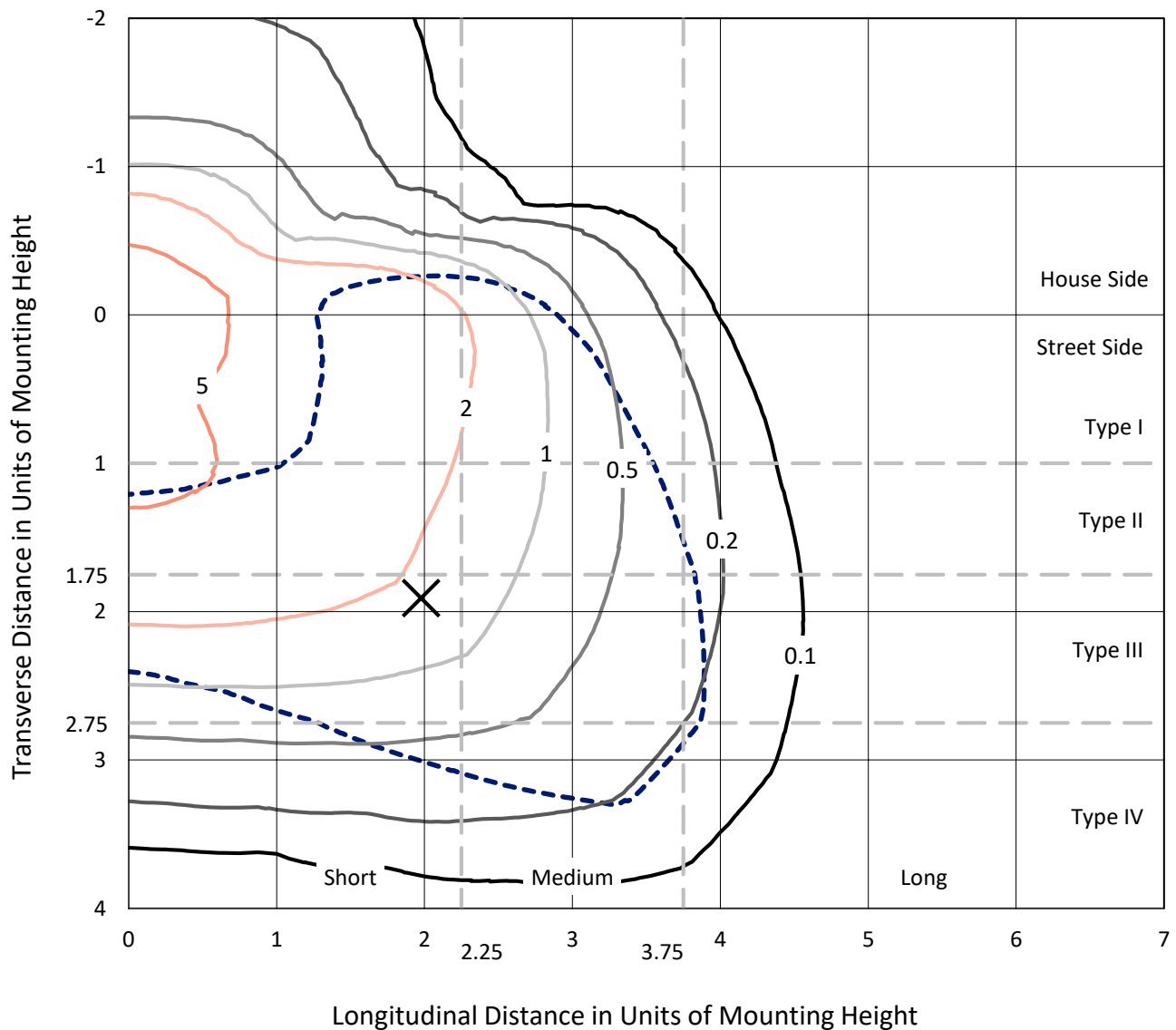


REPORT NUMBER: P319264

CATALOG NUMBER: GLEON-SA0D-722-U-T4W

## Iso-Footcandle Lines of Horizontal Illumination

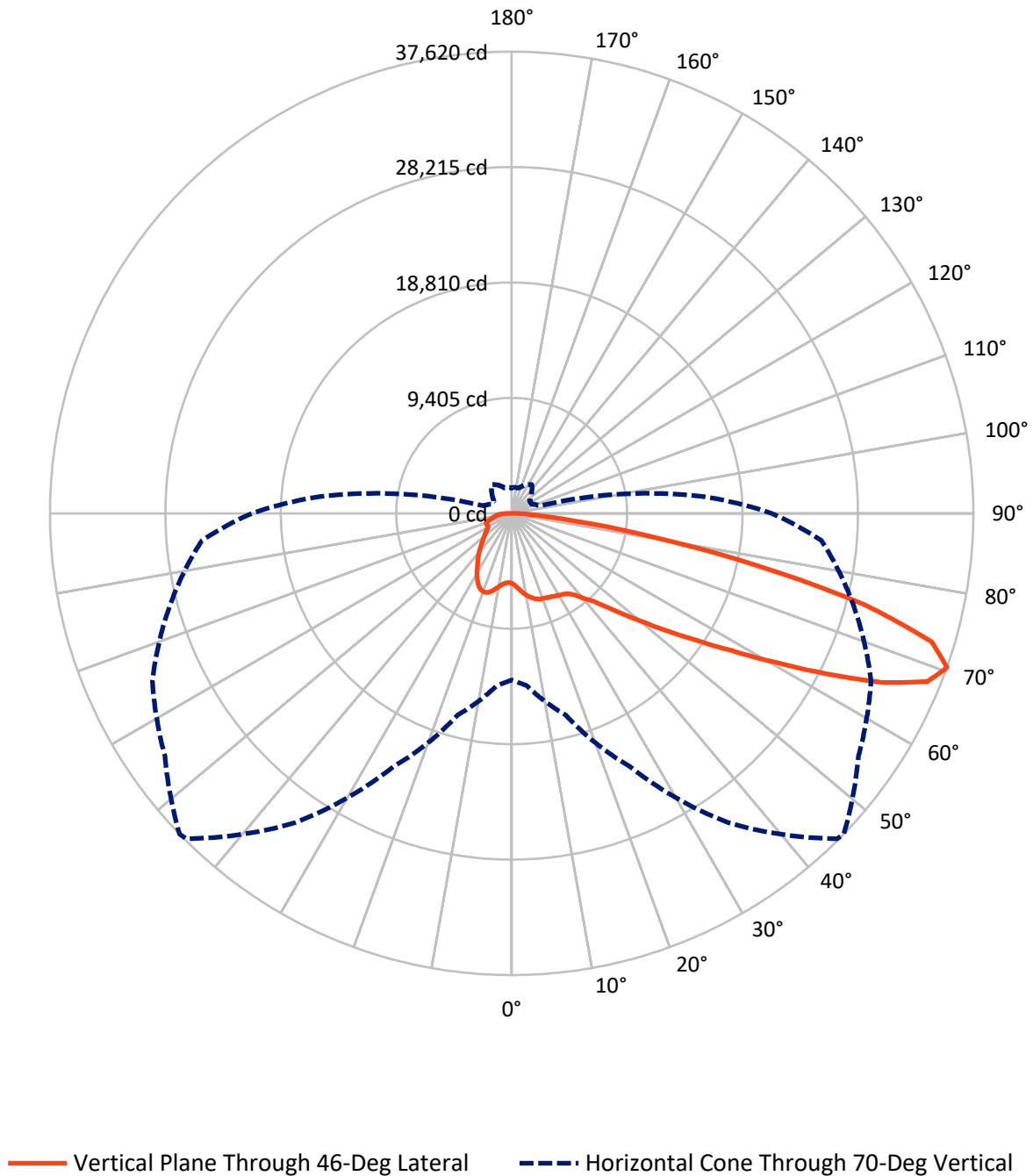
✕ Max cd  
 - - - 1/2 Max cd



Based on 30 foot mounting height. Maximum calculated value = 7.9 fc  
 Type IV - Short - N/A

REPORT NUMBER: P319264  
CATALOG NUMBER: GLEON-SA0D-722-U-T4W

## Luminous Intensity Polar Plot



REPORT NUMBER: P319264

CATALOG NUMBER: GLEON-SA0D-722-U-T4W

**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 12849.2  | 0.0    | 12849.2 |
|                    | % Fixture | 22.9     | 0.0    | 22.9    |
| <b>Street Side</b> | Lumens    | 43212.8  | 0.0    | 43212.8 |
|                    | % Fixture | 77.1     | 0.0    | 77.1    |
| <b>Total</b>       | Lumens    | 56062.0  | 0.0    | 56062.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 582.3   | 1.0       |
| 10°-20°   | 1939.9  | 3.5       |
| 20°-30°   | 3234.6  | 5.8       |
| 30°-40°   | 4590.1  | 8.2       |
| 40°-50°   | 6751.7  | 12.0      |
| 50°-60°   | 11434.0 | 20.4      |
| 60°-70°   | 16230.4 | 29.0      |
| 70°-80°   | 9860.1  | 17.6      |
| 80°-90°   | 1439.0  | 2.6       |
| 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°    | 56062.0 | 100.0     |
| 0°-180°   | 56062.0 | 100.0     |

**Coefficient of Utilization**



REPORT NUMBER: P319264

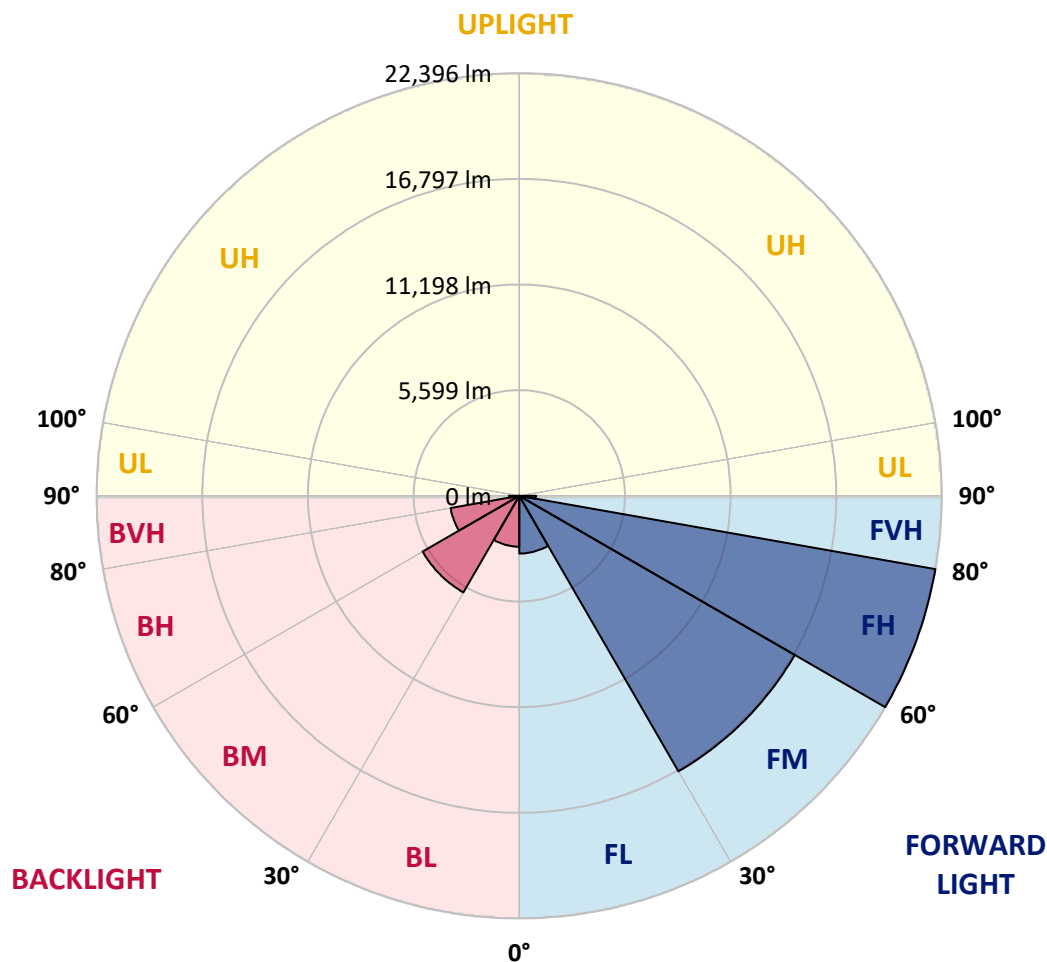
CATALOG NUMBER: GLEON-SA0D-722-U-T4W

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

| Zone |             | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|---------|-----------|-------------------------|------|---------|
|      |             |         |           | B                       | U    | G       |
| FL   | (0°-30°)    | 3059.0  | 5.5       |                         |      |         |
| FM   | (30°-60°)   | 16860.9 | 30.1      |                         |      |         |
| FH   | (60°-80°)   | 22396.5 | 39.9      |                         |      | G5      |
| FVH  | (80°-90°)   | 896.4   | 1.6       |                         |      | G5      |
| BL   | (0°-30°)    | 2697.7  | 4.8       | B4/5000                 |      |         |
| BM   | (30°-60°)   | 5914.8  | 10.6      | B4/8500                 |      |         |
| BH   | (60°-80°)   | 3694.1  | 6.6       | B4/5000                 |      | G4/5000 |
| BVH  | (80°-90°)   | 542.6   | 1.0       |                         |      | G4/750  |
| UL   | (90°-100°)  | 0.0     | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0     | 0.0       |                         | U0/0 |         |

**BUG Rating: B4-U0-G5**

Type IV Short



REPORT NUMBER: P319264

CATALOG NUMBER: GLEON-SA0D-722-U-T4W

**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 45°     | 46°     | 55°     | 65°     | 75°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 5711.6  | 5711.6  | 5711.6  | 5711.6  | 5711.6  | 5711.6  | 5711.6  | 5711.6  | 5711.6  | 5711.6  | 5711.6  |
| 2.5°  | 5997.5  | 6001.3  | 6009.0  | 5989.8  | 5936.1  | 5920.7  | 5915.0  | 5859.4  | 5822.9  | 5769.2  | 5723.1  |
| 5°    | 6477.1  | 6481.0  | 6469.5  | 6415.7  | 6296.8  | 6208.5  | 6200.9  | 6074.2  | 5959.1  | 5836.3  | 5744.2  |
| 7.5°  | 6977.9  | 6983.6  | 6947.2  | 6845.5  | 6678.6  | 6525.1  | 6515.5  | 6342.8  | 6168.2  | 5982.1  | 5844.0  |
| 10°   | 7421.1  | 7398.1  | 7338.6  | 7196.6  | 6999.0  | 6811.0  | 6803.3  | 6622.9  | 6421.5  | 6197.0  | 6012.8  |
| 12.5° | 7716.5  | 7697.4  | 7620.6  | 7447.9  | 7231.1  | 7058.5  | 7043.1  | 6876.2  | 6680.5  | 6434.9  | 6214.3  |
| 15°   | 7879.6  | 7893.0  | 7789.4  | 7593.8  | 7382.7  | 7236.9  | 7223.5  | 7104.5  | 6929.9  | 6682.4  | 6429.2  |
| 17.5° | 7900.7  | 7912.2  | 7812.5  | 7618.7  | 7446.0  | 7346.3  | 7340.5  | 7261.8  | 7135.2  | 6897.3  | 6632.5  |
| 20°   | 7777.9  | 7785.6  | 7703.1  | 7543.9  | 7430.7  | 7400.0  | 7398.1  | 7363.5  | 7269.5  | 7058.5  | 6801.4  |
| 22.5° | 7599.5  | 7605.3  | 7545.8  | 7430.7  | 7392.3  | 7440.3  | 7453.7  | 7440.3  | 7373.1  | 7175.5  | 6933.8  |
| 25°   | 7555.4  | 7551.5  | 7490.1  | 7373.1  | 7405.7  | 7507.4  | 7524.7  | 7530.4  | 7484.4  | 7311.7  | 7102.6  |
| 27.5° | 7768.3  | 7754.9  | 7637.9  | 7449.9  | 7471.0  | 7593.8  | 7616.8  | 7672.4  | 7643.6  | 7492.1  | 7294.5  |
| 30°   | 8384.2  | 8361.2  | 8121.4  | 7741.5  | 7637.9  | 7701.2  | 7730.0  | 7818.2  | 7824.0  | 7697.4  | 7549.6  |
| 32.5° | 9424.1  | 9395.3  | 8965.5  | 8286.4  | 7919.9  | 7810.5  | 7837.4  | 7969.8  | 8040.8  | 7942.9  | 7783.7  |
| 35°   | 10738.3 | 10705.7 | 10141.6 | 9213.0  | 8391.9  | 8019.7  | 8038.9  | 8144.4  | 8286.4  | 8148.2  | 7937.2  |
| 37.5° | 12108.2 | 12029.5 | 11486.6 | 10302.8 | 9142.0  | 8466.7  | 8466.7  | 8480.1  | 8547.3  | 8259.5  | 8117.5  |
| 40°   | 13470.4 | 13391.7 | 12900.5 | 11584.4 | 10112.8 | 9170.8  | 9126.7  | 8829.3  | 8775.6  | 8528.1  | 8480.1  |
| 42.5° | 14736.6 | 14713.6 | 14423.9 | 13032.9 | 11252.5 | 9863.4  | 9802.0  | 9297.5  | 9309.0  | 9155.5  | 9157.4  |
| 45°   | 16083.5 | 16083.5 | 15847.5 | 14494.9 | 12580.1 | 10976.2 | 10914.8 | 10172.3 | 10287.4 | 10216.5 | 10387.2 |
| 47.5° | 17182.8 | 17217.4 | 17184.7 | 16018.2 | 14124.6 | 12390.2 | 12278.9 | 11384.9 | 11707.2 | 11950.9 | 12447.8 |
| 50°   | 18305.2 | 18358.9 | 18364.7 | 17689.3 | 15991.4 | 14070.9 | 13944.3 | 12994.6 | 13714.0 | 14412.4 | 15389.0 |
| 52.5° | 19934.1 | 20054.9 | 19573.4 | 19356.6 | 18278.3 | 16066.2 | 15941.5 | 15064.7 | 16265.7 | 17246.1 | 18928.7 |
| 55°   | 21444.0 | 21338.5 | 20995.0 | 21129.4 | 20726.4 | 18337.8 | 18243.8 | 17474.5 | 19109.1 | 20383.0 | 22568.3 |
| 57.5° | 22261.3 | 22253.6 | 22599.0 | 23174.6 | 23366.4 | 21138.9 | 21060.3 | 20312.0 | 22315.0 | 23272.4 | 25985.3 |
| 60°   | 23220.6 | 23234.0 | 24089.7 | 25396.3 | 26186.7 | 24626.9 | 24592.4 | 24024.5 | 25428.9 | 25969.9 | 28665.5 |
| 62.5° | 23354.9 | 23596.6 | 25070.1 | 27318.7 | 28826.7 | 28702.0 | 28778.7 | 27368.6 | 28214.7 | 28122.6 | 30666.6 |
| 65°   | 21810.4 | 22128.9 | 24795.8 | 27900.0 | 31451.3 | 33158.9 | 33229.9 | 30731.9 | 30411.5 | 29962.5 | 31382.3 |
| 67.5° | 18644.8 | 19116.8 | 22013.8 | 26635.7 | 32316.6 | 36453.1 | 36552.8 | 33339.2 | 32234.1 | 30586.0 | 29659.4 |
| 70°   | 13568.2 | 14092.0 | 17008.2 | 22748.6 | 30774.1 | 37506.4 | 37619.6 | 34492.3 | 32303.2 | 28811.4 | 25319.5 |
| 72.5° | 8196.2  | 8606.8  | 11010.7 | 16747.3 | 25973.8 | 35587.8 | 35789.2 | 33030.3 | 29492.5 | 24404.4 | 18696.6 |
| 75°   | 3599.3  | 3867.9  | 5324.1  | 9650.5  | 18594.9 | 29444.5 | 29695.8 | 28272.2 | 23963.1 | 17735.4 | 11051.0 |
| 77.5° | 1532.9  | 1609.7  | 2183.3  | 4192.1  | 10511.9 | 20120.2 | 20465.5 | 20657.4 | 16258.1 | 9650.5  | 4669.8  |
| 80°   | 955.5   | 986.2   | 1235.6  | 1897.5  | 4919.2  | 11300.5 | 11672.7 | 12154.2 | 8073.4  | 3547.5  | 1630.8  |
| 82.5° | 581.3   | 615.9   | 821.2   | 1147.3  | 2561.3  | 5122.6  | 5301.0  | 5640.6  | 3133.0  | 1532.9  | 844.2   |
| 85°   | 349.2   | 374.1   | 502.7   | 725.2   | 1458.1  | 2014.5  | 2012.6  | 2225.6  | 1475.4  | 986.2   | 445.1   |
| 87.5° | 166.9   | 186.1   | 268.6   | 376.0   | 734.8   | 755.9   | 708.0   | 802.0   | 896.0   | 646.6   | 224.5   |
| 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: P319264

CATALOG NUMBER: GLEON-SA0D-722-U-T4W

**CANDELA DISTRIBUTION (continued):**

|       | 90°     | 95°     | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|---------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 5711.6  | 5711.6  | 5711.6 | 5711.6 | 5711.6 | 5711.6 | 5711.6 | 5711.6 | 5711.6 | 5711.6 | 5711.6 |
| 2.5°  | 5707.8  | 5700.1  | 5675.2 | 5656.0 | 5652.1 | 5640.6 | 5631.0 | 5636.8 | 5644.5 | 5646.4 | 5646.4 |
| 5°    | 5705.9  | 5684.8  | 5652.1 | 5638.7 | 5656.0 | 5679.0 | 5707.8 | 5746.2 | 5769.2 | 5786.4 | 5798.0 |
| 7.5°  | 5798.0  | 5757.7  | 5721.2 | 5713.5 | 5748.1 | 5809.5 | 5874.7 | 5955.3 | 6010.9 | 6049.3 | 6057.0 |
| 10°   | 5951.4  | 5901.6  | 5865.1 | 5872.8 | 5934.2 | 6022.4 | 6114.5 | 6218.1 | 6302.5 | 6354.3 | 6358.2 |
| 12.5° | 6128.0  | 6080.0  | 6045.5 | 6078.1 | 6179.8 | 6287.2 | 6383.1 | 6473.3 | 6550.0 | 6601.8 | 6601.8 |
| 15°   | 6331.3  | 6296.8  | 6256.5 | 6331.3 | 6469.5 | 6565.4 | 6605.7 | 6649.8 | 6692.0 | 6730.4 | 6722.7 |
| 17.5° | 6527.0  | 6494.4  | 6473.3 | 6561.6 | 6705.4 | 6749.6 | 6722.7 | 6690.1 | 6690.1 | 6711.2 | 6715.0 |
| 20°   | 6695.9  | 6667.1  | 6680.5 | 6766.8 | 6841.7 | 6795.6 | 6695.9 | 6592.2 | 6550.0 | 6561.6 | 6573.1 |
| 22.5° | 6843.6  | 6830.2  | 6870.4 | 6910.7 | 6857.0 | 6695.9 | 6511.7 | 6371.6 | 6319.8 | 6316.0 | 6319.8 |
| 25°   | 7016.3  | 7014.3  | 7064.2 | 6991.3 | 6753.4 | 6456.0 | 6208.5 | 6072.3 | 6043.5 | 6066.6 | 6104.9 |
| 27.5° | 7231.1  | 7252.2  | 7277.2 | 7010.5 | 6542.4 | 6093.4 | 5842.1 | 5748.1 | 5776.9 | 5832.5 | 5868.9 |
| 30°   | 7505.5  | 7563.1  | 7509.3 | 6962.5 | 6239.2 | 5679.0 | 5439.2 | 5412.3 | 5491.0 | 5569.6 | 5608.0 |
| 32.5° | 7772.2  | 7862.4  | 7731.9 | 6837.8 | 5847.8 | 5239.6 | 5053.5 | 5045.9 | 5141.8 | 5218.5 | 5272.3 |
| 35°   | 7987.1  | 8165.5  | 7898.8 | 6590.3 | 5395.1 | 4834.8 | 4698.6 | 4646.8 | 4681.3 | 4771.5 | 4832.9 |
| 37.5° | 8267.2  | 8564.6  | 8013.9 | 6212.4 | 4903.9 | 4501.0 | 4341.8 | 4222.8 | 4192.1 | 4228.6 | 4259.3 |
| 40°   | 8779.4  | 9172.7  | 8067.6 | 5684.8 | 4424.3 | 4167.2 | 4006.0 | 3831.4 | 3710.5 | 3622.3 | 3624.2 |
| 42.5° | 9615.9  | 9965.1  | 8033.1 | 5044.0 | 3981.1 | 3841.0 | 3658.7 | 3457.3 | 3261.6 | 3062.1 | 3046.7 |
| 45°   | 10974.3 | 11143.1 | 7929.5 | 4364.8 | 3591.6 | 3499.5 | 3328.7 | 3127.3 | 2866.4 | 2640.0 | 2618.9 |
| 47.5° | 13148.0 | 12773.9 | 7768.3 | 3771.9 | 3248.2 | 3209.8 | 3052.5 | 2820.3 | 2544.0 | 2361.8 | 2346.4 |
| 50°   | 16112.3 | 15128.0 | 7689.7 | 3300.0 | 2945.0 | 2956.5 | 2828.0 | 2582.4 | 2321.5 | 2187.2 | 2171.8 |
| 52.5° | 19657.8 | 17869.7 | 7841.2 | 2935.4 | 2701.4 | 2741.7 | 2645.7 | 2415.5 | 2196.8 | 2091.3 | 2075.9 |
| 55°   | 23335.7 | 20709.2 | 8004.3 | 2670.7 | 2471.1 | 2549.8 | 2517.2 | 2327.2 | 2129.6 | 2031.8 | 2018.3 |
| 57.5° | 26484.1 | 22829.2 | 7678.2 | 2455.8 | 2265.8 | 2388.6 | 2417.4 | 2271.6 | 2095.1 | 2006.8 | 1991.5 |
| 60°   | 28466.0 | 23683.0 | 6822.5 | 2254.3 | 2102.8 | 2260.1 | 2359.9 | 2256.3 | 2108.5 | 2100.8 | 2089.3 |
| 62.5° | 29406.1 | 23608.2 | 5538.9 | 2095.1 | 2001.1 | 2204.5 | 2402.1 | 2342.6 | 2262.0 | 2331.1 | 2336.8 |
| 65°   | 28984.0 | 22480.0 | 4125.0 | 1989.6 | 1928.2 | 2225.6 | 2528.7 | 2505.7 | 2306.1 | 2375.2 | 2384.8 |
| 67.5° | 26205.9 | 19788.3 | 3054.4 | 1897.5 | 1847.6 | 2285.0 | 2758.9 | 2559.4 | 2219.8 | 2269.7 | 2239.0 |
| 70°   | 21181.2 | 15688.3 | 2356.0 | 1793.9 | 1765.1 | 2277.4 | 2862.5 | 2526.8 | 2125.8 | 2137.3 | 2054.8 |
| 72.5° | 14606.2 | 10698.0 | 1916.7 | 1697.9 | 1646.1 | 2075.9 | 2789.6 | 2446.2 | 2047.1 | 1958.9 | 1849.5 |
| 75°   | 7942.9  | 5742.3  | 1628.9 | 1598.2 | 1437.0 | 1822.7 | 2655.3 | 2388.6 | 1976.1 | 1859.1 | 1797.7 |
| 77.5° | 3125.4  | 2382.9  | 1414.0 | 1462.0 | 1256.7 | 1609.7 | 2505.7 | 2279.3 | 1878.3 | 1724.8 | 1694.1 |
| 80°   | 1275.9  | 1216.4  | 1172.3 | 1264.3 | 1080.2 | 1408.2 | 2325.3 | 2150.7 | 1761.3 | 1600.1 | 1538.7 |
| 82.5° | 723.3   | 755.9   | 911.3  | 997.7  | 876.8  | 1297.0 | 2239.0 | 2047.1 | 1621.2 | 1433.2 | 1360.3 |
| 85°   | 370.3   | 443.2   | 635.1  | 715.6  | 644.6  | 1103.2 | 2062.5 | 1792.0 | 1300.8 | 1097.4 | 1103.2 |
| 87.5° | 178.4   | 247.5   | 401.0  | 448.9  | 418.3  | 798.1  | 1540.6 | 1298.9 | 1013.0 | 802.0  | 777.0  |
| 90°   | 0.0     | 0.0     | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

LM-79-2008: Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Report Prepared for

Cooper Lighting Solutions

McGRAW-EDISON

Report Number: SP1-1908-441-10-R4

Test Date: 10/25/2019

Luminaire Tested: SA1C-722-U-5WQ

Data in this report applies to families of products SA1C-722-U-5WQ.

### Test Information

Test Method: LM-79-2008 Report  
 Number: SP1-1908-441-10-R4  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry:  $4\pi$   
 Issue Date: 10/28/2024  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: MCGRAW-EDISON  
 Catalog Number: **SA1C-722-U-5WQ**  
 Description: MCGRAW EDISON ROADWAY AND AREA LUMINAIRE

\*\*\*THIS IS A REVISION OF SP1-1908-441-4-R3. TO UPDATE THE CATALOG INFORMATION.\*\*\*TESTED IN SITU. ROADWAY AND AREA LUMINAIRE. (1) 70 CRI, 5000K, 1050MA LIGHTSQUARE WITH 16 LEDS AND TYPE V WIDE OPTICS.

### Spectral Parameters

|                           |         |           |      |      |       |
|---------------------------|---------|-----------|------|------|-------|
| CCT (K):                  | 2237    | CRI (Ra): | 72.0 |      |       |
| CIE u':                   | 0.2876  | R1:       | 68.9 | R9:  | -17.4 |
| CIE v':                   | 0.5346  | R2:       | 83.0 | R10: | 61.3  |
| Duv:                      | -0.0006 | R3:       | 95.2 | R11: | 59.8  |
| CIE x:                    | 0.5005  | R4:       | 66.2 | R12: | 50.5  |
| CIE y:                    | 0.4134  | R5:       | 65.9 | R13: | 71.1  |
| CIE z:                    | 0.0860  | R6:       | 76.3 | R14: | 96.9  |
| Peak Wavelength (nm):     | 603     | R7:       | 76.7 |      |       |
| Dominant Wavelength (nm): | 587     | R8:       | 43.8 |      |       |
| Purity:                   | 74.5    |           |      |      |       |
| Rf:                       | 69.8    |           |      |      |       |
| Rg:                       | 99.2    |           |      |      |       |



### Test Conditions

Stabilization Time: 71M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 24.7/41%  
 Sphere Temperature (°C): 25.6

REPORT NUMBER: SP1-1908-441-10-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: SP1-1908-441-10-R4



Point lies inside the ANSI 2200K 4-step quadrangle

REPORT NUMBER: SP1-1908-441-10-R4

**Photopic Flux vs. Wavelength**



#####

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 1768             | NR               | 490       | 5206             | NR               | 620       | 130919           | NR               | 750       | 8553             | NR               | 880       | 2713             | NR               |
| 365       | 1569             | NR               | 495       | 7286             | NR               | 625       | 125335           | NR               | 755       | 7696             | NR               | 885       | 2316             | NR               |
| 370       | 1594             | NR               | 500       | 10654            | NR               | 630       | 118388           | NR               | 760       | 6978             | NR               | 890       | 2539             | NR               |
| 375       | 1744             | NR               | 505       | 15189            | NR               | 635       | 111855           | NR               | 765       | 6377             | NR               | 895       | 1933             | NR               |
| 380       | 1659             | NR               | 510       | 20541            | NR               | 640       | 104062           | NR               | 770       | 5600             | NR               | 900       | 2216             | NR               |
| 385       | 1504             | NR               | 515       | 26492            | NR               | 645       | 96365            | NR               | 775       | 5000             | NR               | 905       | 2067             | NR               |
| 390       | 1541             | NR               | 520       | 32294            | NR               | 650       | 88651            | NR               | 780       | 4709             | NR               | 910       | 1959             | NR               |
| 395       | 1355             | NR               | 525       | 38123            | NR               | 655       | 81152            | NR               | 785       | 4305             | NR               | 915       | 1874             | NR               |
| 400       | 1243             | NR               | 530       | 43232            | NR               | 660       | 73523            | NR               | 790       | 4040             | NR               | 920       | 1484             | NR               |
| 405       | 1417             | NR               | 535       | 48012            | NR               | 665       | 66123            | NR               | 795       | 3642             | NR               | 925       | 1914             | NR               |
| 410       | 2147             | NR               | 540       | 52623            | NR               | 670       | 58677            | NR               | 800       | 3594             | NR               | 930       | 1948             | NR               |
| 415       | 3837             | NR               | 545       | 57516            | NR               | 675       | 52349            | NR               | 805       | 3190             | NR               | 935       | 2079             | NR               |
| 420       | 7159             | NR               | 550       | 62613            | NR               | 680       | 46159            | NR               | 810       | 3241             | NR               | 940       | 2263             | NR               |
| 425       | 12599            | NR               | 555       | 68554            | NR               | 685       | 40525            | NR               | 815       | 2732             | NR               | 945       | 1688             | NR               |
| 430       | 19019            | NR               | 560       | 75325            | NR               | 690       | 35615            | NR               | 820       | 2612             | NR               | 950       | 1560             | NR               |
| 435       | 24875            | NR               | 565       | 82533            | NR               | 695       | 31158            | NR               | 825       | 2966             | NR               | 955       | 2826             | NR               |
| 440       | 29103            | NR               | 570       | 90909            | NR               | 700       | 27409            | NR               | 830       | 2574             | NR               | 960       | 1477             | NR               |
| 445       | 29901            | NR               | 575       | 99621            | NR               | 705       | 24204            | NR               | 835       | 2633             | NR               | 965       | 1568             | NR               |
| 450       | 24862            | NR               | 580       | 108484           | NR               | 710       | 21558            | NR               | 840       | 2526             | NR               | 970       | 2030             | NR               |
| 455       | 15942            | NR               | 585       | 116679           | NR               | 715       | 19222            | NR               | 845       | 2631             | NR               | 975       | 1986             | NR               |
| 460       | 9916             | NR               | 590       | 123752           | NR               | 720       | 17310            | NR               | 850       | 2079             | NR               | 980       | 2540             | NR               |
| 465       | 7051             | NR               | 595       | 129324           | NR               | 725       | 15280            | NR               | 855       | 2309             | NR               | 985       | 1139             | NR               |
| 470       | 5227             | NR               | 600       | 134082           | NR               | 730       | 13282            | NR               | 860       | 2528             | NR               | 990       | 2018             | NR               |
| 475       | 4257             | NR               | 605       | 135698           | NR               | 735       | 11753            | NR               | 865       | 2121             | NR               | 995       | 3445             | NR               |
| 480       | 4052             | NR               | 610       | 135144           | NR               | 740       | 10654            | NR               | 870       | 2751             | NR               | 1000      | 3704             | NR               |
| 485       | 4298             | NR               | 615       | 134180           | NR               | 745       | 9451             | NR               | 875       | 2317             | NR               |           |                  |                  |

REPORT NUMBER: SP1-1908-441-10-R4

Scotopic Flux vs. Wavelength



Scotopic Lumens: 4696.9

S/P: 0.85

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 1768             | NR               | 490       | 5206             | NR               | 620       | 130919           | NR               | 750       | 8553             | NR               | 880       | 2713             | NR               |
| 365       | 1569             | NR               | 495       | 7286             | NR               | 625       | 125335           | NR               | 755       | 7696             | NR               | 885       | 2316             | NR               |
| 370       | 1594             | NR               | 500       | 10654            | NR               | 630       | 118388           | NR               | 760       | 6978             | NR               | 890       | 2539             | NR               |
| 375       | 1744             | NR               | 505       | 15189            | NR               | 635       | 111855           | NR               | 765       | 6377             | NR               | 895       | 1933             | NR               |
| 380       | 1659             | NR               | 510       | 20541            | NR               | 640       | 104062           | NR               | 770       | 5600             | NR               | 900       | 2216             | NR               |
| 385       | 1504             | NR               | 515       | 26492            | NR               | 645       | 96365            | NR               | 775       | 5000             | NR               | 905       | 2067             | NR               |
| 390       | 1541             | NR               | 520       | 32294            | NR               | 650       | 88651            | NR               | 780       | 4709             | NR               | 910       | 1959             | NR               |
| 395       | 1355             | NR               | 525       | 38123            | NR               | 655       | 81152            | NR               | 785       | 4305             | NR               | 915       | 1874             | NR               |
| 400       | 1243             | NR               | 530       | 43232            | NR               | 660       | 73523            | NR               | 790       | 4040             | NR               | 920       | 1484             | NR               |
| 405       | 1417             | NR               | 535       | 48012            | NR               | 665       | 66123            | NR               | 795       | 3642             | NR               | 925       | 1914             | NR               |
| 410       | 2147             | NR               | 540       | 52623            | NR               | 670       | 58677            | NR               | 800       | 3594             | NR               | 930       | 1948             | NR               |
| 415       | 3837             | NR               | 545       | 57516            | NR               | 675       | 52349            | NR               | 805       | 3190             | NR               | 935       | 2079             | NR               |
| 420       | 7159             | NR               | 550       | 62613            | NR               | 680       | 46159            | NR               | 810       | 3241             | NR               | 940       | 2263             | NR               |
| 425       | 12599            | NR               | 555       | 68554            | NR               | 685       | 40525            | NR               | 815       | 2732             | NR               | 945       | 1688             | NR               |
| 430       | 19019            | NR               | 560       | 75325            | NR               | 690       | 35615            | NR               | 820       | 2612             | NR               | 950       | 1560             | NR               |
| 435       | 24875            | NR               | 565       | 82533            | NR               | 695       | 31158            | NR               | 825       | 2966             | NR               | 955       | 2826             | NR               |
| 440       | 29103            | NR               | 570       | 90909            | NR               | 700       | 27409            | NR               | 830       | 2574             | NR               | 960       | 1477             | NR               |
| 445       | 29901            | NR               | 575       | 99621            | NR               | 705       | 24204            | NR               | 835       | 2633             | NR               | 965       | 1568             | NR               |
| 450       | 24862            | NR               | 580       | 108484           | NR               | 710       | 21558            | NR               | 840       | 2526             | NR               | 970       | 2030             | NR               |
| 455       | 15942            | NR               | 585       | 116679           | NR               | 715       | 19222            | NR               | 845       | 2631             | NR               | 975       | 1986             | NR               |
| 460       | 9916             | NR               | 590       | 123752           | NR               | 720       | 17310            | NR               | 850       | 2079             | NR               | 980       | 2540             | NR               |
| 465       | 7051             | NR               | 595       | 129324           | NR               | 725       | 15280            | NR               | 855       | 2309             | NR               | 985       | 1139             | NR               |
| 470       | 5227             | NR               | 600       | 134082           | NR               | 730       | 13282            | NR               | 860       | 2528             | NR               | 990       | 2018             | NR               |
| 475       | 4257             | NR               | 605       | 135698           | NR               | 735       | 11753            | NR               | 865       | 2121             | NR               | 995       | 3445             | NR               |
| 480       | 4052             | NR               | 610       | 135144           | NR               | 740       | 10654            | NR               | 870       | 2751             | NR               | 1000      | 3704             | NR               |
| 485       | 4298             | NR               | 615       | 134180           | NR               | 745       | 9451             | NR               | 875       | 2317             | NR               |           |                  |                  |

REPORT NUMBER: SP1-1908-441-10-R4

**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: 1470.8 M/P: 0.27**

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 1768             | NR               | 490       | 5206             | NR               | 620       | 130919           | NR               | 750       | 8553             | NR               | 880       | 2713             | NR               |
| 365       | 1569             | NR               | 495       | 7286             | NR               | 625       | 125335           | NR               | 755       | 7696             | NR               | 885       | 2316             | NR               |
| 370       | 1594             | NR               | 500       | 10654            | NR               | 630       | 118388           | NR               | 760       | 6978             | NR               | 890       | 2539             | NR               |
| 375       | 1744             | NR               | 505       | 15189            | NR               | 635       | 111855           | NR               | 765       | 6377             | NR               | 895       | 1933             | NR               |
| 380       | 1659             | NR               | 510       | 20541            | NR               | 640       | 104062           | NR               | 770       | 5600             | NR               | 900       | 2216             | NR               |
| 385       | 1504             | NR               | 515       | 26492            | NR               | 645       | 96365            | NR               | 775       | 5000             | NR               | 905       | 2067             | NR               |
| 390       | 1541             | NR               | 520       | 32294            | NR               | 650       | 88651            | NR               | 780       | 4709             | NR               | 910       | 1959             | NR               |
| 395       | 1355             | NR               | 525       | 38123            | NR               | 655       | 81152            | NR               | 785       | 4305             | NR               | 915       | 1874             | NR               |
| 400       | 1243             | NR               | 530       | 43232            | NR               | 660       | 73523            | NR               | 790       | 4040             | NR               | 920       | 1484             | NR               |
| 405       | 1417             | NR               | 535       | 48012            | NR               | 665       | 66123            | NR               | 795       | 3642             | NR               | 925       | 1914             | NR               |
| 410       | 2147             | NR               | 540       | 52623            | NR               | 670       | 58677            | NR               | 800       | 3594             | NR               | 930       | 1948             | NR               |
| 415       | 3837             | NR               | 545       | 57516            | NR               | 675       | 52349            | NR               | 805       | 3190             | NR               | 935       | 2079             | NR               |
| 420       | 7159             | NR               | 550       | 62613            | NR               | 680       | 46159            | NR               | 810       | 3241             | NR               | 940       | 2263             | NR               |
| 425       | 12599            | NR               | 555       | 68554            | NR               | 685       | 40525            | NR               | 815       | 2732             | NR               | 945       | 1688             | NR               |
| 430       | 19019            | NR               | 560       | 75325            | NR               | 690       | 35615            | NR               | 820       | 2612             | NR               | 950       | 1560             | NR               |
| 435       | 24875            | NR               | 565       | 82533            | NR               | 695       | 31158            | NR               | 825       | 2966             | NR               | 955       | 2826             | NR               |
| 440       | 29103            | NR               | 570       | 90909            | NR               | 700       | 27409            | NR               | 830       | 2574             | NR               | 960       | 1477             | NR               |
| 445       | 29901            | NR               | 575       | 99621            | NR               | 705       | 24204            | NR               | 835       | 2633             | NR               | 965       | 1568             | NR               |
| 450       | 24862            | NR               | 580       | 108484           | NR               | 710       | 21558            | NR               | 840       | 2526             | NR               | 970       | 2030             | NR               |
| 455       | 15942            | NR               | 585       | 116679           | NR               | 715       | 19222            | NR               | 845       | 2631             | NR               | 975       | 1986             | NR               |
| 460       | 9916             | NR               | 590       | 123752           | NR               | 720       | 17310            | NR               | 850       | 2079             | NR               | 980       | 2540             | NR               |
| 465       | 7051             | NR               | 595       | 129324           | NR               | 725       | 15280            | NR               | 855       | 2309             | NR               | 985       | 1139             | NR               |
| 470       | 5227             | NR               | 600       | 134082           | NR               | 730       | 13282            | NR               | 860       | 2528             | NR               | 990       | 2018             | NR               |
| 475       | 4257             | NR               | 605       | 135698           | NR               | 735       | 11753            | NR               | 865       | 2121             | NR               | 995       | 3445             | NR               |
| 480       | 4052             | NR               | 610       | 135144           | NR               | 740       | 10654            | NR               | 870       | 2751             | NR               | 1000      | 3704             | NR               |
| 485       | 4298             | NR               | 615       | 134180           | NR               | 745       | 9451             | NR               | 875       | 2317             | NR               |           |                  |                  |

REPORT NUMBER: SP1-1908-441-10-R4

**TM-30-18**

### Summary

$R_f = 69.8$   
 $R_g = 99.2$   
 CIE  $R_a = 72.0$   
 $R_g = -17.4$



### Color Vector Graphics



REPORT NUMBER: SP1-1908-441-10-R4

**TM-30-18**

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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 87 | CES26 = 56 | CES51 = 74 | CES76 = 56 |
| CES02 = 65 | CES27 = 76 | CES52 = 76 | CES77 = 81 |
| CES03 = 32 | CES28 = 83 | CES53 = 65 | CES78 = 63 |
| CES04 = 72 | CES29 = 46 | CES54 = 78 | CES79 = 84 |
| CES05 = 52 | CES30 = 48 | CES55 = 75 | CES80 = 84 |
| CES06 = 52 | CES31 = 51 | CES56 = 65 | CES81 = 63 |
| CES07 = 44 | CES32 = 51 | CES57 = 62 | CES82 = 92 |
| CES08 = 42 | CES33 = 53 | CES58 = 66 | CES83 = 83 |
| CES09 = 29 | CES34 = 70 | CES59 = 84 | CES84 = 92 |
| CES10 = 78 | CES35 = 85 | CES60 = 90 | CES85 = 81 |
| CES11 = 61 | CES36 = 78 | CES61 = 84 | CES86 = 56 |
| CES12 = 68 | CES37 = 80 | CES62 = 70 | CES87 = 78 |
| CES13 = 45 | CES38 = 53 | CES63 = 68 | CES88 = 72 |
| CES14 = 75 | CES39 = 90 | CES64 = 69 | CES89 = 62 |
| CES15 = 72 | CES40 = 84 | CES65 = 67 | CES90 = 67 |
| CES16 = 49 | CES41 = 75 | CES66 = 64 | CES91 = 90 |
| CES17 = 51 | CES42 = 79 | CES67 = 63 | CES92 = 67 |
| CES18 = 57 | CES43 = 64 | CES68 = 69 | CES93 = 79 |
| CES19 = 74 | CES44 = 98 | CES69 = 80 | CES94 = 52 |
| CES20 = 68 | CES45 = 73 | CES70 = 63 | CES95 = 76 |
| CES21 = 89 | CES46 = 67 | CES71 = 63 | CES96 = 78 |
| CES22 = 81 | CES47 = 60 | CES72 = 87 | CES97 = 77 |
| CES23 = 92 | CES48 = 48 | CES73 = 56 | CES98 = 71 |
| CES24 = 92 | CES49 = 64 | CES74 = 87 | CES99 = 65 |
| CES25 = 74 | CES50 = 74 | CES75 = 66 |            |



REPORT NUMBER: SP1-1908-441-10-R4

**TM-30-18**

Color Rendition by Hue-Angle Bin



REPORT NUMBER: SP1-1908-441-10-R4

**TM-30-18**

**Measure Comparisons**



(END OF REPORT)