

Signify Classified - Internal  
Cooper Lighting Solutions Photometric Lab  
1121 Highway 74 South  
Peachtree City, GA 30269



Scaled data based on original data using  
LM-79-08 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: P319023

Luminaire Tested: **GLEON-SA9D-730-U-T4W**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P319023  
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-SA9D-730-U-T4W  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(9) 70 CRI, 3000K, 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: 62729 lumens  
Efficiency: N/A  
Efficacy: 109.1 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): 575  
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



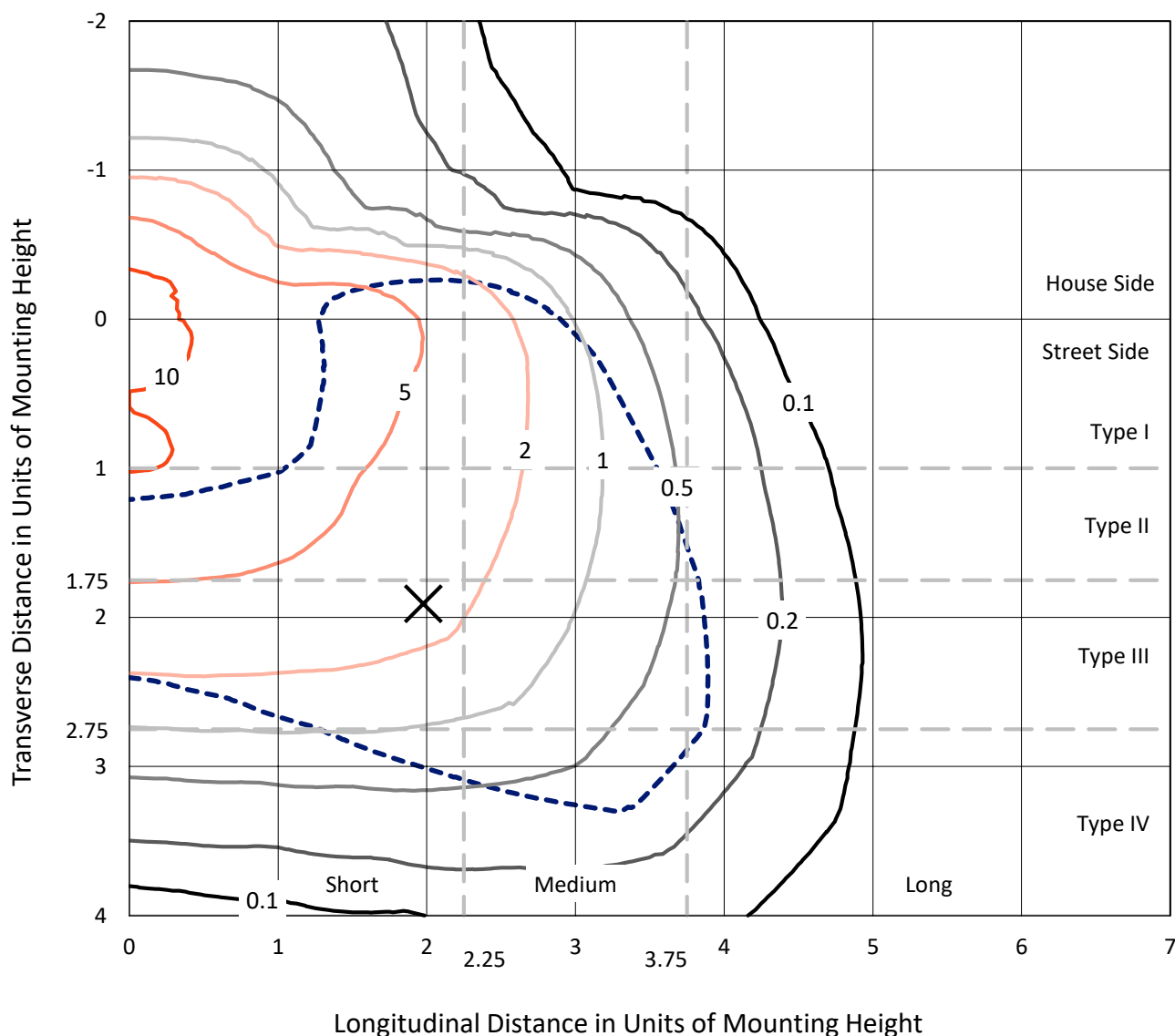
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## Iso-Footcandle Lines of Horizontal Illumination

✕ Max cd

--- 1/2 Max cd

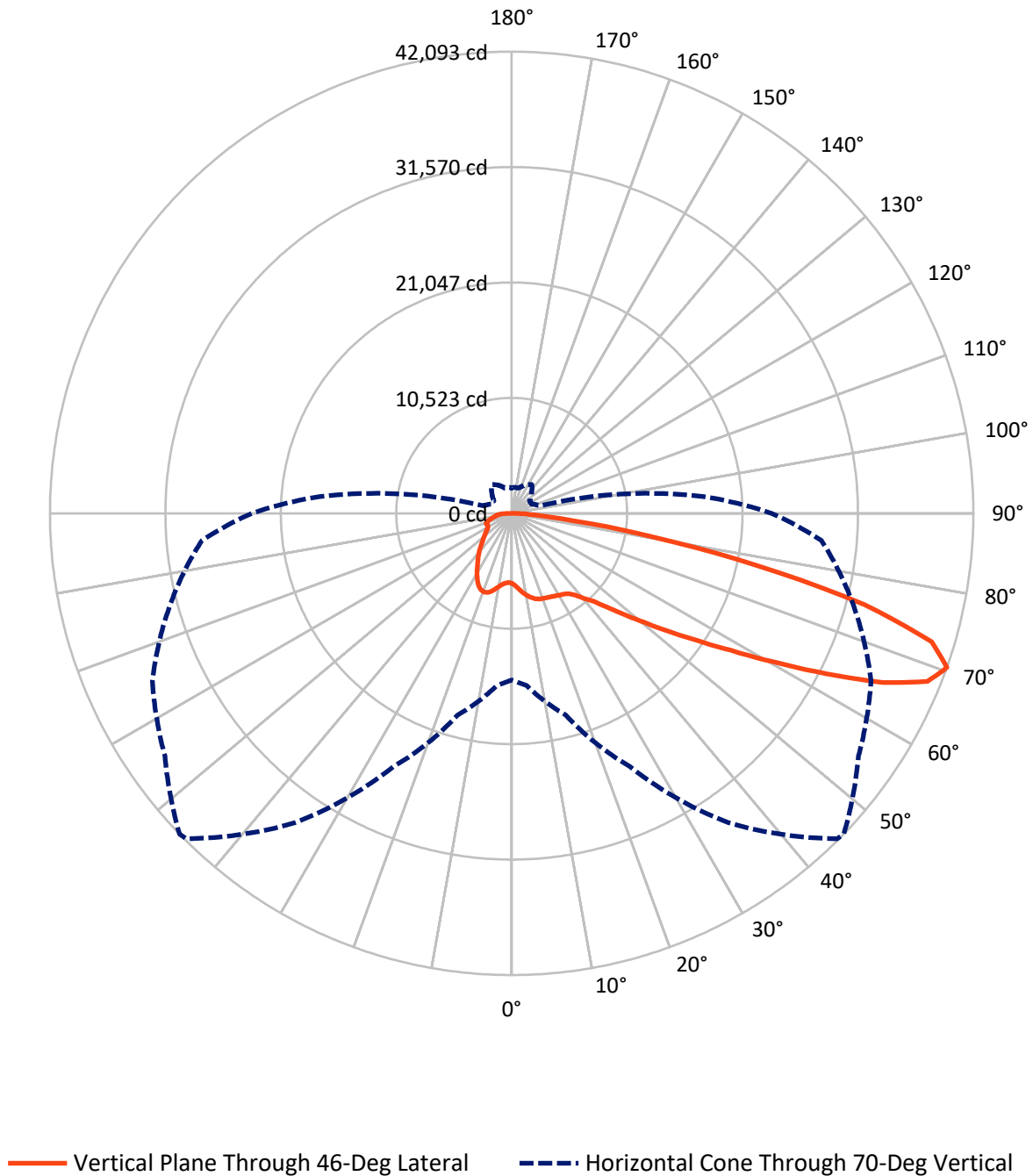


Based on 25 foot mounting height. Maximum calculated value = 12.8 fc

Type IV - Short - N/A

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CATALOG NUMBER: GLEON-SA9D-730-U-T4W

## Luminous Intensity Polar Plot



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CATALOG NUMBER: GLEON-SA9D-730-U-T4W

**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 14377.3  | 0.0    | 14377.3 |
|                    | % Fixture | 22.9     | 0.0    | 22.9    |
| <b>Street Side</b> | Lumens    | 48351.7  | 0.0    | 48351.7 |
|                    | % Fixture | 77.1     | 0.0    | 77.1    |
| <b>Total</b>       | Lumens    | 62729.0  | 0.0    | 62729.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 651.5   | 1.0       |
| 10°-20°   | 2170.6  | 3.5       |
| 20°-30°   | 3619.2  | 5.8       |
| 30°-40°   | 5135.9  | 8.2       |
| 40°-50°   | 7554.7  | 12.0      |
| 50°-60°   | 12793.8 | 20.4      |
| 60°-70°   | 18160.5 | 29.0      |
| 70°-80°   | 11032.7 | 17.6      |
| 80°-90°   | 1610.1  | 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°    | 62729.0 | 100.0     |
| 0°-180°   | 62729.0 | 100.0     |

**Coefficient of Utilization**



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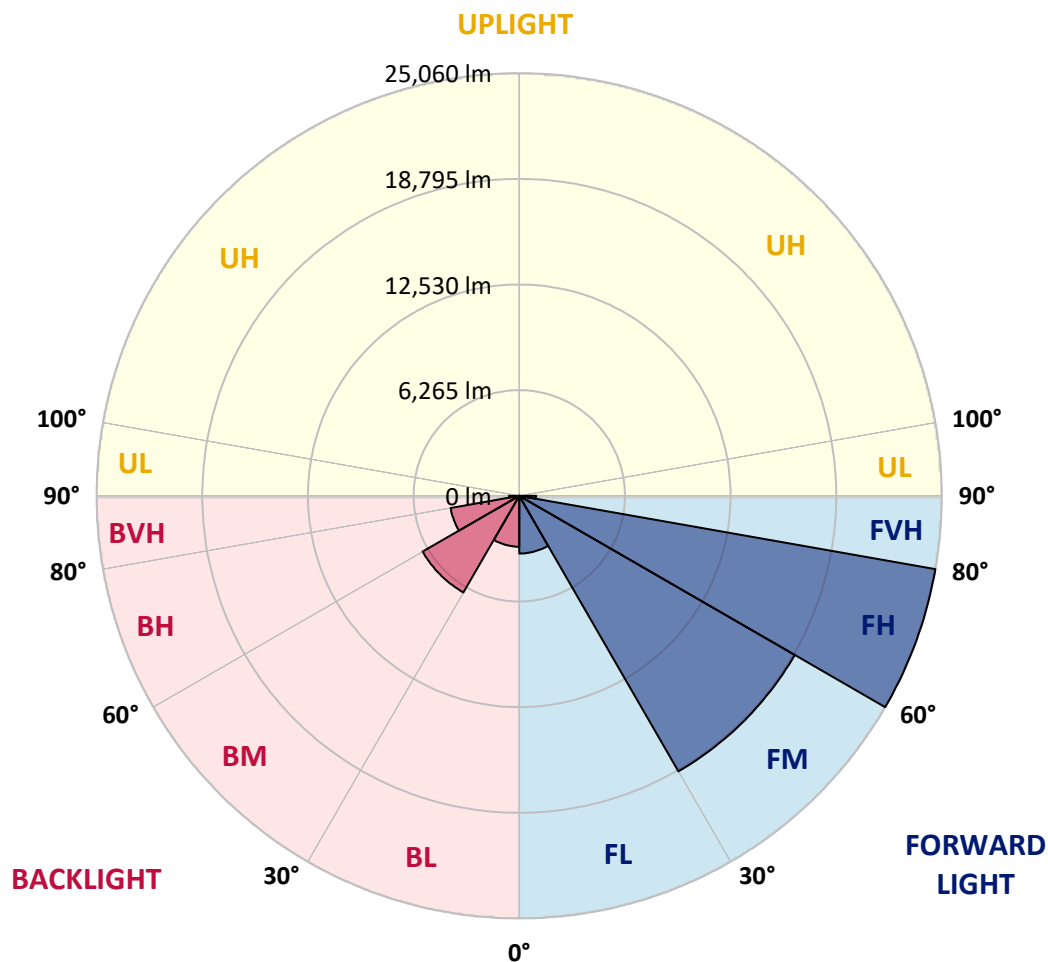
CATALOG NUMBER: GLEON-SA9D-730-U-T4W

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

| Zone |             | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|---------|-----------|-------------------------|------|---------|
|      |             |         |           | B                       | U    | G       |
| FL   | (0°-30°)    | 3422.8  | 5.5       |                         |      |         |
| FM   | (30°-60°)   | 18866.1 | 30.1      |                         |      |         |
| FH   | (60°-80°)   | 25059.9 | 39.9      |                         |      | G5      |
| FVH  | (80°-90°)   | 1002.9  | 1.6       |                         |      | G5      |
| BL   | (0°-30°)    | 3018.6  | 4.8       | B4/5000                 |      |         |
| BM   | (30°-60°)   | 6618.3  | 10.6      | B4/8500                 |      |         |
| BH   | (60°-80°)   | 4133.4  | 6.6       | B4/5000                 |      | G4/5000 |
| BVH  | (80°-90°)   | 607.1   | 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





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CATALOG NUMBER: GLEON-SA9D-730-U-T4W

**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 45°     | 46°     | 55°     | 65°     | 75°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 6390.9  | 6390.9  | 6390.9  | 6390.9  | 6390.9  | 6390.9  | 6390.9  | 6390.9  | 6390.9  | 6390.9  | 6390.9  |
| 2.5°  | 6710.7  | 6715.0  | 6723.6  | 6702.1  | 6642.0  | 6624.9  | 6618.4  | 6556.2  | 6515.4  | 6455.3  | 6403.7  |
| 5°    | 7247.4  | 7251.7  | 7238.8  | 7178.7  | 7045.6  | 6946.9  | 6938.3  | 6796.6  | 6667.8  | 6530.4  | 6427.4  |
| 7.5°  | 7807.7  | 7814.1  | 7773.4  | 7659.6  | 7472.8  | 7301.1  | 7290.3  | 7097.1  | 6901.8  | 6693.5  | 6539.0  |
| 10°   | 8303.6  | 8277.8  | 8211.3  | 8052.4  | 7831.3  | 7620.9  | 7612.4  | 7410.6  | 7185.2  | 6934.0  | 6727.9  |
| 12.5° | 8634.2  | 8612.7  | 8526.9  | 8333.7  | 8091.1  | 7897.9  | 7880.7  | 7693.9  | 7475.0  | 7200.2  | 6953.3  |
| 15°   | 8816.7  | 8831.7  | 8715.8  | 8496.8  | 8260.7  | 8097.5  | 8082.5  | 7949.4  | 7754.0  | 7477.1  | 7193.7  |
| 17.5° | 8840.3  | 8853.2  | 8741.5  | 8524.7  | 8331.5  | 8219.9  | 8213.4  | 8125.4  | 7983.7  | 7717.5  | 7421.3  |
| 20°   | 8702.9  | 8711.5  | 8619.2  | 8441.0  | 8314.3  | 8280.0  | 8277.8  | 8239.2  | 8134.0  | 7897.9  | 7610.2  |
| 22.5° | 8503.3  | 8509.7  | 8443.1  | 8314.3  | 8271.4  | 8325.1  | 8340.1  | 8325.1  | 8249.9  | 8028.8  | 7758.3  |
| 25°   | 8453.9  | 8449.6  | 8380.9  | 8249.9  | 8286.4  | 8400.2  | 8419.5  | 8426.0  | 8374.4  | 8181.2  | 7947.2  |
| 27.5° | 8692.2  | 8677.1  | 8546.2  | 8335.8  | 8359.4  | 8496.8  | 8522.6  | 8584.8  | 8552.6  | 8383.0  | 8161.9  |
| 30°   | 9381.3  | 9355.5  | 9087.2  | 8662.1  | 8546.2  | 8617.0  | 8649.2  | 8748.0  | 8754.4  | 8612.7  | 8447.4  |
| 32.5° | 10544.8 | 10512.6 | 10031.7 | 9271.8  | 8861.8  | 8739.4  | 8769.4  | 8917.6  | 8997.0  | 8887.5  | 8709.3  |
| 35°   | 12015.3 | 11978.8 | 11347.7 | 10308.7 | 9389.9  | 8973.4  | 8994.9  | 9112.9  | 9271.8  | 9117.2  | 8881.1  |
| 37.5° | 13548.1 | 13460.1 | 12852.6 | 11528.0 | 10229.2 | 9473.6  | 9473.6  | 9488.6  | 9563.7  | 9241.7  | 9082.9  |
| 40°   | 15072.3 | 14984.3 | 14434.7 | 12962.0 | 11315.5 | 10261.4 | 10212.1 | 9879.3  | 9819.2  | 9542.3  | 9488.6  |
| 42.5° | 16489.1 | 16463.4 | 16139.2 | 14582.8 | 12590.7 | 11036.4 | 10967.7 | 10403.1 | 10416.0 | 10244.3 | 10246.4 |
| 45°   | 17996.2 | 17996.2 | 17732.1 | 16218.7 | 14076.2 | 12281.5 | 12212.8 | 11382.0 | 11510.8 | 11431.4 | 11622.5 |
| 47.5° | 19226.2 | 19264.9 | 19228.4 | 17923.2 | 15804.3 | 13863.7 | 13739.2 | 12738.8 | 13099.4 | 13372.1 | 13928.1 |
| 50°   | 20482.1 | 20542.2 | 20548.6 | 19793.0 | 17893.1 | 15744.2 | 15602.5 | 14539.9 | 15344.9 | 16126.3 | 17219.0 |
| 52.5° | 22304.7 | 22439.9 | 21901.1 | 21658.5 | 20452.0 | 17976.8 | 17837.3 | 16856.2 | 18200.1 | 19297.1 | 21179.8 |
| 55°   | 23994.2 | 23876.1 | 23491.8 | 23642.1 | 23191.3 | 20518.6 | 20413.4 | 19552.5 | 21381.6 | 22807.0 | 25252.2 |
| 57.5° | 24908.7 | 24900.1 | 25286.5 | 25930.5 | 26145.2 | 23652.8 | 23564.8 | 22727.6 | 24968.8 | 26040.0 | 29075.5 |
| 60°   | 25982.0 | 25997.1 | 26954.5 | 28416.5 | 29300.9 | 27555.6 | 27517.0 | 26881.5 | 28452.9 | 29058.3 | 32074.5 |
| 62.5° | 26132.3 | 26402.8 | 28051.5 | 30567.5 | 32254.8 | 32115.3 | 32201.2 | 30623.3 | 31570.0 | 31467.0 | 34313.6 |
| 65°   | 24404.2 | 24760.5 | 27744.5 | 31218.0 | 35191.6 | 37102.2 | 37181.6 | 34386.5 | 34028.0 | 33525.7 | 35114.3 |
| 67.5° | 20862.1 | 21390.2 | 24631.7 | 29803.2 | 36159.8 | 40788.1 | 40899.8 | 37304.0 | 36067.4 | 34223.4 | 33186.5 |
| 70°   | 15181.8 | 15767.8 | 19030.9 | 25453.9 | 34433.8 | 41966.7 | 42093.4 | 38594.2 | 36144.7 | 32237.7 | 28330.6 |
| 72.5° | 9170.9  | 9630.3  | 12320.2 | 18738.9 | 29062.6 | 39820.0 | 40045.4 | 36958.3 | 32999.8 | 27306.6 | 20920.0 |
| 75°   | 4027.3  | 4327.8  | 5957.2  | 10798.1 | 20806.2 | 32946.1 | 33227.3 | 31634.4 | 26812.8 | 19844.5 | 12365.2 |
| 77.5° | 1715.2  | 1801.1  | 2443.0  | 4690.6  | 11762.0 | 22512.9 | 22899.3 | 23114.0 | 18191.5 | 10798.1 | 5225.2  |
| 80°   | 1069.1  | 1103.4  | 1382.5  | 2123.1  | 5504.3  | 12644.3 | 13060.8 | 13599.6 | 9033.5  | 3969.3  | 1824.7  |
| 82.5° | 650.5   | 689.1   | 918.8   | 1283.8  | 2865.9  | 5731.8  | 5931.5  | 6311.4  | 3505.6  | 1715.2  | 944.6   |
| 85°   | 390.7   | 418.6   | 562.4   | 811.5   | 1631.5  | 2254.1  | 2251.9  | 2490.2  | 1650.8  | 1103.4  | 498.0   |
| 87.5° | 186.8   | 208.2   | 300.5   | 420.8   | 822.2   | 845.8   | 792.1   | 897.3   | 1002.5  | 723.5   | 251.2   |
| 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: P319023

CATALOG NUMBER: GLEON-SA9D-730-U-T4W

**CANDELA DISTRIBUTION (continued):**

|       | 90°     | 95°     | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|---------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 6390.9  | 6390.9  | 6390.9 | 6390.9 | 6390.9 | 6390.9 | 6390.9 | 6390.9 | 6390.9 | 6390.9 | 6390.9 |
| 2.5°  | 6386.6  | 6378.0  | 6350.1 | 6328.6 | 6324.3 | 6311.4 | 6300.7 | 6307.1 | 6315.7 | 6317.9 | 6317.9 |
| 5°    | 6384.4  | 6360.8  | 6324.3 | 6309.3 | 6328.6 | 6354.4 | 6386.6 | 6429.5 | 6455.3 | 6474.6 | 6487.5 |
| 7.5°  | 6487.5  | 6442.4  | 6401.6 | 6393.0 | 6431.6 | 6500.3 | 6573.3 | 6663.5 | 6725.7 | 6768.7 | 6777.3 |
| 10°   | 6659.2  | 6603.4  | 6562.6 | 6571.2 | 6639.9 | 6738.6 | 6841.7 | 6957.6 | 7052.1 | 7110.0 | 7114.3 |
| 12.5° | 6856.7  | 6803.0  | 6764.4 | 6800.9 | 6914.7 | 7034.9 | 7142.2 | 7243.1 | 7329.0 | 7386.9 | 7386.9 |
| 15°   | 7084.3  | 7045.6  | 7000.5 | 7084.3 | 7238.8 | 7346.2 | 7391.2 | 7440.6 | 7487.8 | 7530.8 | 7522.2 |
| 17.5° | 7303.2  | 7266.7  | 7243.1 | 7341.9 | 7502.9 | 7552.2 | 7522.2 | 7485.7 | 7485.7 | 7509.3 | 7513.6 |
| 20°   | 7492.1  | 7459.9  | 7475.0 | 7571.6 | 7655.3 | 7603.8 | 7492.1 | 7376.2 | 7329.0 | 7341.9 | 7354.7 |
| 22.5° | 7657.4  | 7642.4  | 7687.5 | 7732.6 | 7672.5 | 7492.1 | 7286.0 | 7129.3 | 7071.4 | 7067.1 | 7071.4 |
| 25°   | 7850.6  | 7848.5  | 7904.3 | 7822.7 | 7556.5 | 7223.8 | 6946.9 | 6794.4 | 6762.2 | 6788.0 | 6830.9 |
| 27.5° | 8091.1  | 8114.7  | 8142.6 | 7844.2 | 7320.4 | 6818.1 | 6536.8 | 6431.6 | 6463.8 | 6526.1 | 6566.9 |
| 30°   | 8398.1  | 8462.5  | 8402.4 | 7790.5 | 6981.2 | 6354.4 | 6086.0 | 6056.0 | 6144.0 | 6232.0 | 6274.9 |
| 32.5° | 8696.5  | 8797.4  | 8651.4 | 7651.0 | 6543.3 | 5862.8 | 5654.5 | 5645.9 | 5753.3 | 5839.1 | 5899.3 |
| 35°   | 8936.9  | 9136.5  | 8838.1 | 7374.1 | 6036.6 | 5409.8 | 5257.4 | 5199.4 | 5238.1 | 5339.0 | 5407.6 |
| 37.5° | 9250.3  | 9583.1  | 8967.0 | 6951.2 | 5487.1 | 5036.3 | 4858.1 | 4725.0 | 4690.6 | 4731.4 | 4765.8 |
| 40°   | 9823.5  | 10263.6 | 9027.1 | 6360.8 | 4950.4 | 4662.7 | 4482.4 | 4287.0 | 4151.8 | 4053.1 | 4055.2 |
| 42.5° | 10759.5 | 11150.2 | 8988.4 | 5643.8 | 4454.5 | 4297.8 | 4093.8 | 3868.4 | 3649.5 | 3426.2 | 3409.0 |
| 45°   | 12279.4 | 12468.3 | 8872.5 | 4883.8 | 4018.7 | 3915.7 | 3724.6 | 3499.2 | 3207.2 | 2953.9 | 2930.3 |
| 47.5° | 14711.6 | 14293.0 | 8692.2 | 4220.5 | 3634.4 | 3591.5 | 3415.5 | 3155.7 | 2846.6 | 2642.6 | 2625.5 |
| 50°   | 18028.4 | 16927.1 | 8604.2 | 3692.4 | 3295.3 | 3308.1 | 3164.3 | 2889.5 | 2597.6 | 2447.3 | 2430.1 |
| 52.5° | 21995.5 | 19994.8 | 8773.7 | 3284.5 | 3022.6 | 3067.7 | 2960.4 | 2702.8 | 2458.0 | 2340.0 | 2322.8 |
| 55°   | 26110.8 | 23172.0 | 8956.2 | 2988.3 | 2765.0 | 2853.0 | 2816.5 | 2604.0 | 2382.9 | 2273.4 | 2258.4 |
| 57.5° | 29633.7 | 25544.1 | 8591.3 | 2747.8 | 2535.3 | 2672.7 | 2704.9 | 2541.7 | 2344.2 | 2245.5 | 2228.3 |
| 60°   | 31851.2 | 26499.4 | 7633.8 | 2522.4 | 2352.8 | 2528.9 | 2640.5 | 2524.6 | 2359.3 | 2350.7 | 2337.8 |
| 62.5° | 32903.1 | 26415.7 | 6197.7 | 2344.2 | 2239.1 | 2466.6 | 2687.7 | 2621.2 | 2531.0 | 2608.3 | 2614.7 |
| 65°   | 32430.9 | 25153.4 | 4615.5 | 2226.2 | 2157.5 | 2490.2 | 2829.4 | 2803.6 | 2580.4 | 2657.7 | 2668.4 |
| 67.5° | 29322.4 | 22141.5 | 3417.6 | 2123.1 | 2067.3 | 2556.8 | 3087.0 | 2863.8 | 2483.8 | 2539.6 | 2505.3 |
| 70°   | 23700.1 | 17553.9 | 2636.2 | 2007.2 | 1975.0 | 2548.2 | 3202.9 | 2827.3 | 2378.6 | 2391.5 | 2299.2 |
| 72.5° | 16343.2 | 11970.2 | 2144.6 | 1899.9 | 1841.9 | 2322.8 | 3121.4 | 2737.1 | 2290.6 | 2191.8 | 2069.5 |
| 75°   | 8887.5  | 6425.2  | 1822.6 | 1788.2 | 1607.9 | 2039.4 | 2971.1 | 2672.7 | 2211.1 | 2080.2 | 2011.5 |
| 77.5° | 3497.0  | 2666.3  | 1582.2 | 1635.8 | 1406.1 | 1801.1 | 2803.6 | 2550.3 | 2101.7 | 1929.9 | 1895.6 |
| 80°   | 1427.6  | 1361.0  | 1311.7 | 1414.7 | 1208.6 | 1575.7 | 2601.9 | 2406.5 | 1970.7 | 1790.4 | 1721.7 |
| 82.5° | 809.3   | 845.8   | 1019.7 | 1116.3 | 981.1  | 1451.2 | 2505.3 | 2290.6 | 1814.0 | 1603.6 | 1522.0 |
| 85°   | 414.3   | 495.9   | 710.6  | 800.7  | 721.3  | 1234.4 | 2307.7 | 2005.1 | 1455.5 | 1227.9 | 1234.4 |
| 87.5° | 199.6   | 276.9   | 448.7  | 502.3  | 468.0  | 893.0  | 1723.8 | 1453.3 | 1133.5 | 897.3  | 869.4  |
| 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: SP1-1908-441-2-R4

Test Date: 10/03/2019

Luminaire Tested: SA1C-730-U-5WQ

Data in this report applies to families of products SA1C-730-U-5WQ .

### Test Information

Test Method: LM-79-2008  
Report Number: SP1-1908-441-2-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-730-U-5WQ**  
Description: MCGRAW EDISON ROADWAY AND AREA LUMINAIRE

\*\*\*THIS IS A REVISION OF SP1-1908-441-2-R3. TO UPDATE THE CATALOG INFORMATION.\*\*\*TESTED IN SITU. (1) 70 CRI, 3000K, 1050MA LIGHTSQUARE WITH 16 LEDS AND TYPE V WIDE OPTICS.

### Spectral Parameters

|                           |        |           |      |      |       |
|---------------------------|--------|-----------|------|------|-------|
| CCT (K):                  | 2993   | CRI (Ra): | 71.8 |      |       |
| CIE u':                   | 0.2508 | R1:       | 67.5 | R9:  | -38.3 |
| CIE v':                   | 0.5215 | R2:       | 82.9 | R10: | 62.5  |
| Duv:                      | 0.0000 | R3:       | 94.7 | R11: | 63.7  |
| CIE x:                    | 0.4374 | R4:       | 67.7 | R12: | 57.8  |
| CIE y:                    | 0.4043 | R5:       | 67.9 | R13: | 70.4  |
| CIE z:                    | 0.1583 | R6:       | 77.6 | R14: | 97.3  |
| Peak Wavelength (nm):     | 593    | R7:       | 76.0 |      |       |
| Dominant Wavelength (nm): | 582    | R8:       | 40.5 |      |       |
| Purity:                   | 53     |           |      |      |       |
| Rf:                       | 75.7   |           |      |      |       |
| Rg:                       | 93.9   |           |      |      |       |



### Test Conditions

Stabilization Time: 53M  
Operation Time: 12H  
Room Temperature (°C) / RH%: 25.0./44%  
Sphere Temperature (°C): 25.7

REPORT NUMBER: SP1-1908-441-2-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 3000K 4-step quadrangle

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**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       | 2397             | NR               | 490       | 24908            | NR               | 620       | 118784           | NR               | 750       | 5037             | NR               | 880       | 2677             | NR               |
| 365       | 2084             | NR               | 495       | 30998            | NR               | 625       | 108951           | NR               | 755       | 4413             | NR               | 885       | 2940             | NR               |
| 370       | 2143             | NR               | 500       | 37103            | NR               | 630       | 99573            | NR               | 760       | 4189             | NR               | 890       | 3116             | NR               |
| 375       | 2413             | NR               | 505       | 42987            | NR               | 635       | 90444            | NR               | 765       | 3677             | NR               | 895       | 3345             | NR               |
| 380       | 2172             | NR               | 510       | 48702            | NR               | 640       | 80749            | NR               | 770       | 3366             | NR               | 900       | 2312             | NR               |
| 385       | 1997             | NR               | 515       | 53741            | NR               | 645       | 71664            | NR               | 775       | 3211             | NR               | 905       | 2829             | NR               |
| 390       | 1830             | NR               | 520       | 57283            | NR               | 650       | 63936            | NR               | 780       | 2682             | NR               | 910       | 2783             | NR               |
| 395       | 1861             | NR               | 525       | 61876            | NR               | 655       | 56611            | NR               | 785       | 2804             | NR               | 915       | 2662             | NR               |
| 400       | 1717             | NR               | 530       | 65398            | NR               | 660       | 49763            | NR               | 790       | 2581             | NR               | 920       | 3047             | NR               |
| 405       | 1761             | NR               | 535       | 69597            | NR               | 665       | 42891            | NR               | 795       | 2711             | NR               | 925       | 2256             | NR               |
| 410       | 2680             | NR               | 540       | 74214            | NR               | 670       | 36939            | NR               | 800       | 2609             | NR               | 930       | 2976             | NR               |
| 415       | 4374             | NR               | 545       | 79911            | NR               | 675       | 31946            | NR               | 805       | 2581             | NR               | 935       | 3503             | NR               |
| 420       | 8071             | NR               | 550       | 86153            | NR               | 680       | 27385            | NR               | 810       | 2404             | NR               | 940       | 4226             | NR               |
| 425       | 15169            | NR               | 555       | 93952            | NR               | 685       | 23504            | NR               | 815       | 2556             | NR               | 945       | 2930             | NR               |
| 430       | 26038            | NR               | 560       | 102904           | NR               | 690       | 20210            | NR               | 820       | 2742             | NR               | 950       | 2115             | NR               |
| 435       | 41316            | NR               | 565       | 112009           | NR               | 695       | 17459            | NR               | 825       | 2014             | NR               | 955       | 2634             | NR               |
| 440       | 59674            | NR               | 570       | 121662           | NR               | 700       | 15207            | NR               | 830       | 2488             | NR               | 960       | 4200             | NR               |
| 445       | 72751            | NR               | 575       | 130476           | NR               | 705       | 13322            | NR               | 835       | 2625             | NR               | 965       | 1982             | NR               |
| 450       | 65091            | NR               | 580       | 137926           | NR               | 710       | 11676            | NR               | 840       | 2754             | NR               | 970       | 3613             | NR               |
| 455       | 44894            | NR               | 585       | 143406           | NR               | 715       | 10626            | NR               | 845       | 2708             | NR               | 975       | 4034             | NR               |
| 460       | 32712            | NR               | 590       | 147039           | NR               | 720       | 9416             | NR               | 850       | 2608             | NR               | 980       | 3922             | NR               |
| 465       | 25296            | NR               | 595       | 147365           | NR               | 725       | 8333             | NR               | 855       | 2605             | NR               | 985       | 1909             | NR               |
| 470       | 19318            | NR               | 600       | 145800           | NR               | 730       | 7134             | NR               | 860       | 1765             | NR               | 990       | 3617             | NR               |
| 475       | 17265            | NR               | 605       | 141363           | NR               | 735       | 6437             | NR               | 865       | 2581             | NR               | 995       | 4767             | NR               |
| 480       | 18260            | NR               | 610       | 134199           | NR               | 740       | 5834             | NR               | 870       | 3016             | NR               | 1000      | 2528             | NR               |
| 485       | 20845            | NR               | 615       | 127683           | NR               | 745       | 5500             | NR               | 875       | 3952             | NR               |           |                  |                  |

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Scotopic Flux vs. Wavelength



Scotopic Lumens: 8494.8

S/P: 1.23

| 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       | 2397             | NR               | 490       | 24908            | NR               | 620       | 118784           | NR               | 750       | 5037             | NR               | 880       | 2677             | NR               |
| 365       | 2084             | NR               | 495       | 30998            | NR               | 625       | 108951           | NR               | 755       | 4413             | NR               | 885       | 2940             | NR               |
| 370       | 2143             | NR               | 500       | 37103            | NR               | 630       | 99573            | NR               | 760       | 4189             | NR               | 890       | 3116             | NR               |
| 375       | 2413             | NR               | 505       | 42987            | NR               | 635       | 90444            | NR               | 765       | 3677             | NR               | 895       | 3345             | NR               |
| 380       | 2172             | NR               | 510       | 48702            | NR               | 640       | 80749            | NR               | 770       | 3366             | NR               | 900       | 2312             | NR               |
| 385       | 1997             | NR               | 515       | 53741            | NR               | 645       | 71664            | NR               | 775       | 3211             | NR               | 905       | 2829             | NR               |
| 390       | 1830             | NR               | 520       | 57283            | NR               | 650       | 63936            | NR               | 780       | 2682             | NR               | 910       | 2783             | NR               |
| 395       | 1861             | NR               | 525       | 61876            | NR               | 655       | 56611            | NR               | 785       | 2804             | NR               | 915       | 2662             | NR               |
| 400       | 1717             | NR               | 530       | 65398            | NR               | 660       | 49763            | NR               | 790       | 2581             | NR               | 920       | 3047             | NR               |
| 405       | 1761             | NR               | 535       | 69597            | NR               | 665       | 42891            | NR               | 795       | 2711             | NR               | 925       | 2256             | NR               |
| 410       | 2680             | NR               | 540       | 74214            | NR               | 670       | 36939            | NR               | 800       | 2609             | NR               | 930       | 2976             | NR               |
| 415       | 4374             | NR               | 545       | 79911            | NR               | 675       | 31946            | NR               | 805       | 2581             | NR               | 935       | 3503             | NR               |
| 420       | 8071             | NR               | 550       | 86153            | NR               | 680       | 27385            | NR               | 810       | 2404             | NR               | 940       | 4226             | NR               |
| 425       | 15169            | NR               | 555       | 93952            | NR               | 685       | 23504            | NR               | 815       | 2556             | NR               | 945       | 2930             | NR               |
| 430       | 26038            | NR               | 560       | 102904           | NR               | 690       | 20210            | NR               | 820       | 2742             | NR               | 950       | 2115             | NR               |
| 435       | 41316            | NR               | 565       | 112009           | NR               | 695       | 17459            | NR               | 825       | 2014             | NR               | 955       | 2634             | NR               |
| 440       | 59674            | NR               | 570       | 121662           | NR               | 700       | 15207            | NR               | 830       | 2488             | NR               | 960       | 4200             | NR               |
| 445       | 72751            | NR               | 575       | 130476           | NR               | 705       | 13322            | NR               | 835       | 2625             | NR               | 965       | 1982             | NR               |
| 450       | 65091            | NR               | 580       | 137926           | NR               | 710       | 11676            | NR               | 840       | 2754             | NR               | 970       | 3613             | NR               |
| 455       | 44894            | NR               | 585       | 143406           | NR               | 715       | 10626            | NR               | 845       | 2708             | NR               | 975       | 4034             | NR               |
| 460       | 32712            | NR               | 590       | 147039           | NR               | 720       | 9416             | NR               | 850       | 2608             | NR               | 980       | 3922             | NR               |
| 465       | 25296            | NR               | 595       | 147365           | NR               | 725       | 8333             | NR               | 855       | 2605             | NR               | 985       | 1909             | NR               |
| 470       | 19318            | NR               | 600       | 145800           | NR               | 730       | 7134             | NR               | 860       | 1765             | NR               | 990       | 3617             | NR               |
| 475       | 17265            | NR               | 605       | 141363           | NR               | 735       | 6437             | NR               | 865       | 2581             | NR               | 995       | 4767             | NR               |
| 480       | 18260            | NR               | 610       | 134199           | NR               | 740       | 5834             | NR               | 870       | 3016             | NR               | 1000      | 2528             | NR               |
| 485       | 20845            | NR               | 615       | 127683           | NR               | 745       | 5500             | NR               | 875       | 3952             | NR               |           |                  |                  |

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**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: 3101.5 M/P: 0.45**

| 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       | 2397             | NR               | 490       | 24908            | NR               | 620       | 118784           | NR               | 750       | 5037             | NR               | 880       | 2677             | NR               |
| 365       | 2084             | NR               | 495       | 30998            | NR               | 625       | 108951           | NR               | 755       | 4413             | NR               | 885       | 2940             | NR               |
| 370       | 2143             | NR               | 500       | 37103            | NR               | 630       | 99573            | NR               | 760       | 4189             | NR               | 890       | 3116             | NR               |
| 375       | 2413             | NR               | 505       | 42987            | NR               | 635       | 90444            | NR               | 765       | 3677             | NR               | 895       | 3345             | NR               |
| 380       | 2172             | NR               | 510       | 48702            | NR               | 640       | 80749            | NR               | 770       | 3366             | NR               | 900       | 2312             | NR               |
| 385       | 1997             | NR               | 515       | 53741            | NR               | 645       | 71664            | NR               | 775       | 3211             | NR               | 905       | 2829             | NR               |
| 390       | 1830             | NR               | 520       | 57283            | NR               | 650       | 63936            | NR               | 780       | 2682             | NR               | 910       | 2783             | NR               |
| 395       | 1861             | NR               | 525       | 61876            | NR               | 655       | 56611            | NR               | 785       | 2804             | NR               | 915       | 2662             | NR               |
| 400       | 1717             | NR               | 530       | 65398            | NR               | 660       | 49763            | NR               | 790       | 2581             | NR               | 920       | 3047             | NR               |
| 405       | 1761             | NR               | 535       | 69597            | NR               | 665       | 42891            | NR               | 795       | 2711             | NR               | 925       | 2256             | NR               |
| 410       | 2680             | NR               | 540       | 74214            | NR               | 670       | 36939            | NR               | 800       | 2609             | NR               | 930       | 2976             | NR               |
| 415       | 4374             | NR               | 545       | 79911            | NR               | 675       | 31946            | NR               | 805       | 2581             | NR               | 935       | 3503             | NR               |
| 420       | 8071             | NR               | 550       | 86153            | NR               | 680       | 27385            | NR               | 810       | 2404             | NR               | 940       | 4226             | NR               |
| 425       | 15169            | NR               | 555       | 93952            | NR               | 685       | 23504            | NR               | 815       | 2556             | NR               | 945       | 2930             | NR               |
| 430       | 26038            | NR               | 560       | 102904           | NR               | 690       | 20210            | NR               | 820       | 2742             | NR               | 950       | 2115             | NR               |
| 435       | 41316            | NR               | 565       | 112009           | NR               | 695       | 17459            | NR               | 825       | 2014             | NR               | 955       | 2634             | NR               |
| 440       | 59674            | NR               | 570       | 121662           | NR               | 700       | 15207            | NR               | 830       | 2488             | NR               | 960       | 4200             | NR               |
| 445       | 72751            | NR               | 575       | 130476           | NR               | 705       | 13322            | NR               | 835       | 2625             | NR               | 965       | 1982             | NR               |
| 450       | 65091            | NR               | 580       | 137926           | NR               | 710       | 11676            | NR               | 840       | 2754             | NR               | 970       | 3613             | NR               |
| 455       | 44894            | NR               | 585       | 143406           | NR               | 715       | 10626            | NR               | 845       | 2708             | NR               | 975       | 4034             | NR               |
| 460       | 32712            | NR               | 590       | 147039           | NR               | 720       | 9416             | NR               | 850       | 2608             | NR               | 980       | 3922             | NR               |
| 465       | 25296            | NR               | 595       | 147365           | NR               | 725       | 8333             | NR               | 855       | 2605             | NR               | 985       | 1909             | NR               |
| 470       | 19318            | NR               | 600       | 145800           | NR               | 730       | 7134             | NR               | 860       | 1765             | NR               | 990       | 3617             | NR               |
| 475       | 17265            | NR               | 605       | 141363           | NR               | 735       | 6437             | NR               | 865       | 2581             | NR               | 995       | 4767             | NR               |
| 480       | 18260            | NR               | 610       | 134199           | NR               | 740       | 5834             | NR               | 870       | 3016             | NR               | 1000      | 2528             | NR               |
| 485       | 20845            | NR               | 615       | 127683           | NR               | 745       | 5500             | NR               | 875       | 3952             | NR               |           |                  |                  |

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**Summary**

$R_f = 75.7$   
 $R_g = 93.9$   
 CIE  $R_a = 71.8$   
 $R_g = -38.3$



**Color Vector Graphics**



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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 67 | CES51 = 87 | CES76 = 63 |
| CES02 = 63 | CES27 = 88 | CES52 = 86 | CES77 = 80 |
| CES03 = 31 | CES28 = 87 | CES53 = 78 | CES78 = 67 |
| CES04 = 71 | CES29 = 66 | CES54 = 84 | CES79 = 87 |
| CES05 = 49 | CES30 = 73 | CES55 = 84 | CES80 = 86 |
| CES06 = 51 | CES31 = 70 | CES56 = 75 | CES81 = 71 |
| CES07 = 41 | CES32 = 65 | CES57 = 74 | CES82 = 94 |
| CES08 = 40 | CES33 = 73 | CES58 = 76 | CES83 = 90 |
| CES09 = 29 | CES34 = 79 | CES59 = 85 | CES84 = 89 |
| CES10 = 76 | CES35 = 89 | CES60 = 93 | CES85 = 77 |
| CES11 = 59 | CES36 = 97 | CES61 = 84 | CES86 = 61 |
| CES12 = 65 | CES37 = 87 | CES62 = 91 | CES87 = 78 |
| CES13 = 43 | CES38 = 81 | CES63 = 77 | CES88 = 77 |
| CES14 = 74 | CES39 = 95 | CES64 = 72 | CES89 = 67 |
| CES15 = 71 | CES40 = 92 | CES65 = 68 | CES90 = 76 |
| CES16 = 47 | CES41 = 88 | CES66 = 69 | CES91 = 89 |
| CES17 = 50 | CES42 = 89 | CES67 = 67 | CES92 = 58 |
| CES18 = 56 | CES43 = 79 | CES68 = 72 | CES93 = 74 |
| CES19 = 73 | CES44 = 99 | CES69 = 81 | CES94 = 49 |
| CES20 = 66 | CES45 = 85 | CES70 = 66 | CES95 = 68 |
| CES21 = 87 | CES46 = 80 | CES71 = 67 | CES96 = 76 |
| CES22 = 79 | CES47 = 82 | CES72 = 88 | CES97 = 82 |
| CES23 = 92 | CES48 = 69 | CES73 = 59 | CES98 = 75 |
| CES24 = 91 | CES49 = 80 | CES74 = 95 | CES99 = 62 |
| CES25 = 73 | CES50 = 87 | CES75 = 69 |            |



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**Color Rendition by Hue-Angle Bin**



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**Measure Comparisons**



(END OF REPORT)