

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: P322337

Luminaire Tested: **GLEON-SA3D-760-U-T3-HSS**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P322337  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-15)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA3D-760-U-T3-HSS  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(3) 70 CRI, 5700K, 1200mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE III  
OPTICS WITH HOUSE SIDE SHIELD  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 17262 lumens  
Efficiency: N/A  
Efficacy: 90.4 lumens/watt  
Luminous Opening: Rectangular (W 1' x L: 1' x H: 0')  
IES Classification: Type III - Short  
BUG Rating: B2 - U0 - G3

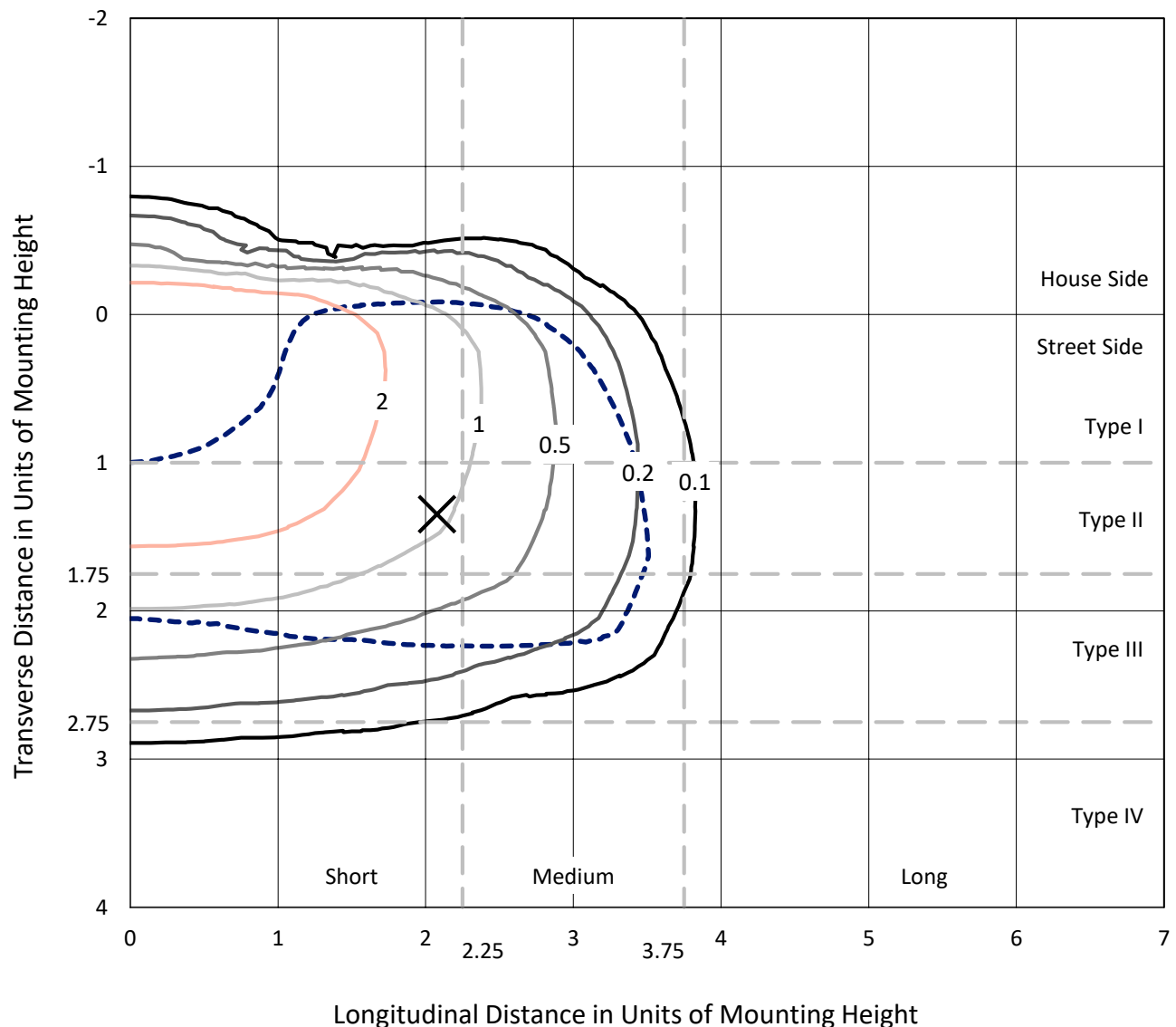
Input Watts (W): 191  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



REPORT NUMBER: P322337  
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## Iso-Footcandle Lines of Horizontal Illumination

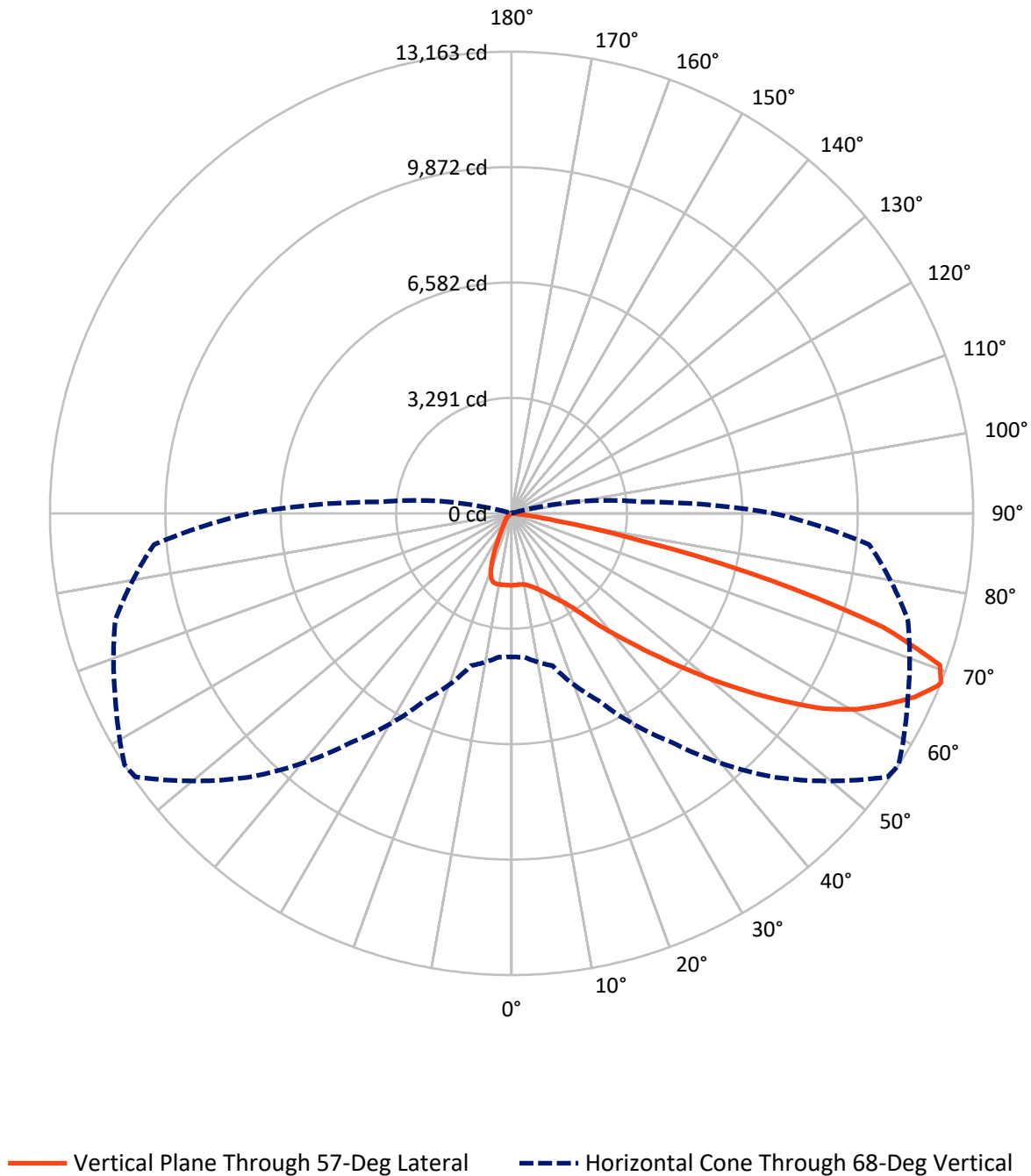
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 4.2 fc  
 Type III - Short - N/A

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## Luminous Intensity Polar Plot



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CATALOG NUMBER: GLEON-SA3D-760-U-T3-HSS

**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 1892.9   | 0.0    | 1892.9  |
|                    | % Fixture | 11.0     | 0.0    | 11.0    |
| <b>Street Side</b> | Lumens    | 15369.1  | 0.0    | 15369.1 |
|                    | % Fixture | 89.0     | 0.0    | 89.0    |
| <b>Total</b>       | Lumens    | 17262.0  | 0.0    | 17262.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 192.0   | 1.1       |
| 10°-20°   | 531.9   | 3.1       |
| 20°-30°   | 917.6   | 5.3       |
| 30°-40°   | 1583.8  | 9.2       |
| 40°-50°   | 2709.1  | 15.7      |
| 50°-60°   | 4334.3  | 25.1      |
| 60°-70°   | 5007.9  | 29.0      |
| 70°-80°   | 1913.6  | 11.1      |
| 80°-90°   | 71.7    | 0.4       |
| 90°-100°  | 0.0     | 0.0       |
| 100°-110° | 0.0     | 0.0       |
| 110°-120° | 0.0     | 0.0       |
| 120°-130° | 0.0     | 0.0       |
| 130°-140° | 0.0     | 0.0       |
| 140°-150° | 0.0     | 0.0       |
| 150°-160° | 0.0     | 0.0       |
| 160°-170° | 0.0     | 0.0       |
| 170°-180° | 0.0     | 0.0       |
| 0°-90°    | 17262.0 | 100.0     |
| 0°-180°   | 17262.0 | 100.0     |

**Coefficient of Utilization**



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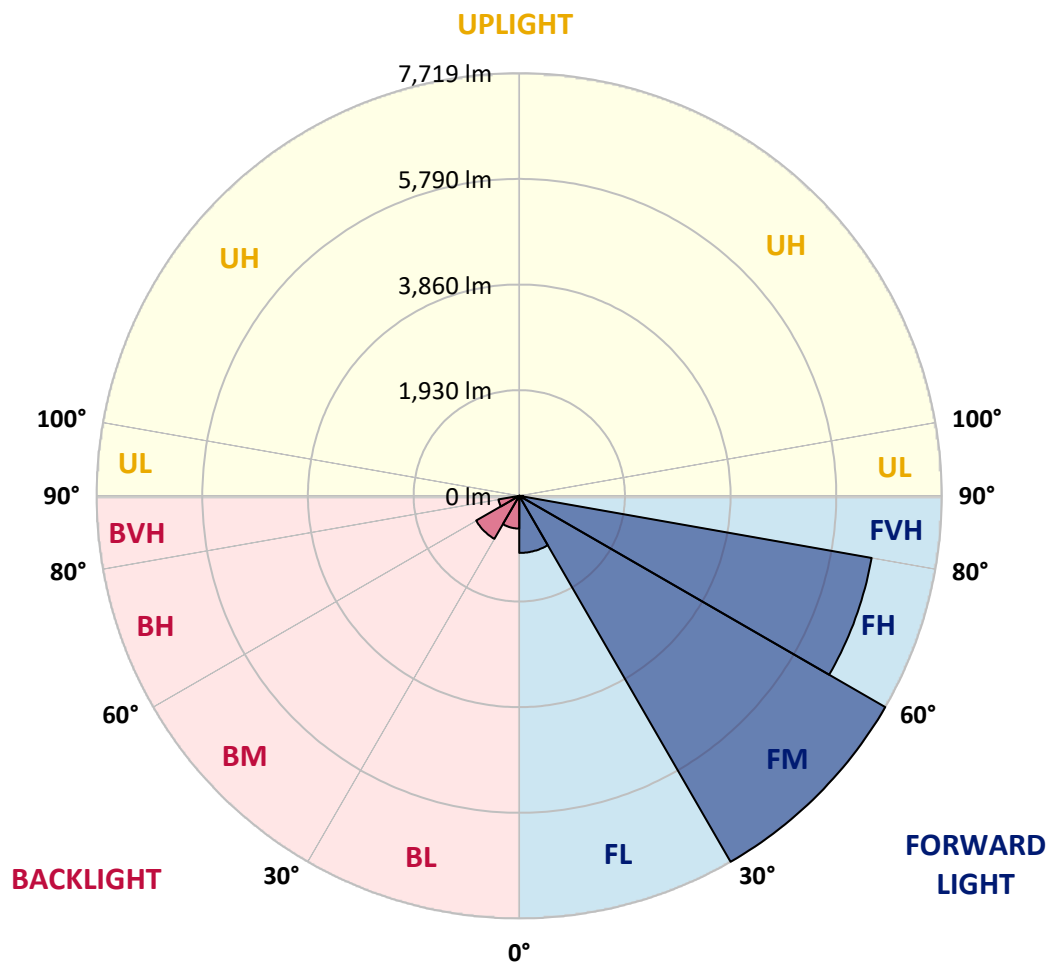
CATALOG NUMBER: GLEON-SA3D-760-U-T3-HSS

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 1043.3 | 6.0       |                         |      |         |
| FM   | (30°-60°)   | 7719.4 | 44.7      |                         |      |         |
| FH   | (60°-80°)   | 6535.9 | 37.9      |                         |      | G3/7500 |
| FVH  | (80°-90°)   | 70.4   | 0.4       |                         |      | G1/100  |
| BL   | (0°-30°)    | 598.2  | 3.5       | B2/1000                 |      |         |
| BM   | (30°-60°)   | 907.9  | 5.3       | B1/1000                 |      |         |
| BH   | (60°-80°)   | 385.5  | 2.2       | B1/500                  |      | G1/500  |
| BVH  | (80°-90°)   | 1.3    | 0.0       |                         |      | G0/10   |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B2-U0-G3**

Type III Short





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CATALOG NUMBER: GLEON-SA3D-760-U-T3-HSS

**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°     | 45°     | 55°     | 57°     | 65°     | 75°     | 85°     |
|-------|--------|--------|--------|--------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 2051.2 | 2051.2 | 2051.2 | 2051.2 | 2051.2  | 2051.2  | 2051.2  | 2051.2  | 2051.2  | 2051.2  | 2051.2  |
| 2.5°  | 2003.0 | 2012.0 | 2018.5 | 2022.6 | 2027.5  | 2038.1  | 2041.4  | 2046.3  | 2048.7  | 2048.7  | 2054.4  |
| 5°    | 1923.8 | 1933.6 | 1947.5 | 1958.9 | 1981.8  | 2011.2  | 2032.4  | 2040.6  | 2055.3  | 2068.3  | 2075.7  |
| 7.5°  | 1850.4 | 1861.8 | 1878.1 | 1905.1 | 1944.3  | 1991.6  | 2035.7  | 2047.1  | 2075.7  | 2103.4  | 2117.3  |
| 10°   | 1803.0 | 1812.0 | 1833.2 | 1871.6 | 1923.0  | 1989.1  | 2051.2  | 2065.1  | 2114.0  | 2160.6  | 2186.7  |
| 12.5° | 1786.7 | 1794.9 | 1816.9 | 1860.2 | 1923.8  | 2001.4  | 2087.1  | 2107.5  | 2179.3  | 2247.1  | 2283.8  |
| 15°   | 1810.4 | 1812.0 | 1835.7 | 1876.5 | 1939.4  | 2031.6  | 2146.7  | 2171.2  | 2261.8  | 2349.9  | 2395.6  |
| 17.5° | 1901.8 | 1894.5 | 1906.7 | 1924.7 | 1974.5  | 2071.6  | 2209.5  | 2246.3  | 2367.1  | 2470.7  | 2514.0  |
| 20°   | 2130.4 | 2130.4 | 2102.6 | 2053.6 | 2054.4  | 2133.6  | 2294.4  | 2336.0  | 2483.8  | 2603.8  | 2642.9  |
| 22.5° | 2521.3 | 2514.0 | 2458.5 | 2338.5 | 2228.3  | 2240.5  | 2398.1  | 2451.9  | 2624.2  | 2752.3  | 2765.4  |
| 25°   | 2991.5 | 2982.5 | 2896.8 | 2727.8 | 2536.8  | 2413.6  | 2538.5  | 2600.5  | 2791.5  | 2905.0  | 2878.0  |
| 27.5° | 3489.4 | 3482.0 | 3397.1 | 3187.4 | 2915.6  | 2689.5  | 2705.8  | 2764.6  | 2962.1  | 3073.9  | 2988.2  |
| 30°   | 3971.8 | 3974.2 | 3890.1 | 3674.7 | 3366.9  | 3041.3  | 2918.0  | 2952.3  | 3127.8  | 3241.2  | 3118.8  |
| 32.5° | 4430.5 | 4433.7 | 4361.1 | 4120.3 | 3833.0  | 3450.2  | 3211.9  | 3202.9  | 3320.4  | 3432.2  | 3291.8  |
| 35°   | 4839.4 | 4847.6 | 4797.8 | 4610.9 | 4306.4  | 3905.7  | 3593.0  | 3571.8  | 3593.9  | 3720.4  | 3557.1  |
| 37.5° | 5233.7 | 5238.6 | 5201.0 | 5043.5 | 4788.8  | 4406.0  | 4074.6  | 4044.4  | 3997.1  | 4094.2  | 3907.3  |
| 40°   | 5665.4 | 5653.2 | 5609.9 | 5467.1 | 5248.3  | 4958.6  | 4592.1  | 4539.9  | 4457.4  | 4543.9  | 4367.6  |
| 42.5° | 6067.0 | 6053.1 | 6060.5 | 5898.9 | 5714.4  | 5526.7  | 5195.3  | 5105.5  | 5057.3  | 5156.9  | 4932.5  |
| 45°   | 6569.0 | 6561.7 | 6586.1 | 6445.8 | 6296.4  | 6160.1  | 5886.6  | 5788.7  | 5767.5  | 5884.2  | 5615.6  |
| 47.5° | 7064.5 | 7082.4 | 7158.3 | 7098.7 | 7038.3  | 6918.3  | 6618.8  | 6574.7  | 6587.8  | 6729.0  | 6336.4  |
| 50°   | 7477.5 | 7498.7 | 7706.8 | 7775.4 | 7862.7  | 7792.5  | 7492.2  | 7465.2  | 7516.6  | 7644.0  | 7111.8  |
| 52.5° | 7776.2 | 7819.5 | 8078.2 | 8394.1 | 8712.4  | 8759.8  | 8460.2  | 8435.7  | 8505.1  | 8524.7  | 7710.9  |
| 55°   | 7983.5 | 8021.9 | 8314.9 | 8892.8 | 9540.9  | 9744.9  | 9558.8  | 9464.2  | 9451.1  | 9257.7  | 8341.0  |
| 57.5° | 8020.3 | 8016.2 | 8437.3 | 9215.2 | 10190.6 | 10717.1 | 10599.5 | 10506.5 | 10238.8 | 9935.1  | 9063.4  |
| 60°   | 7812.9 | 7836.6 | 8325.5 | 9327.0 | 10598.7 | 11452.5 | 11461.5 | 11340.7 | 10923.6 | 10593.8 | 9763.7  |
| 62.5° | 7174.6 | 7271.0 | 7764.8 | 9034.0 | 10593.8 | 11748.8 | 12093.2 | 12001.0 | 11502.3 | 11133.3 | 10473.8 |
| 65°   | 6139.7 | 6173.9 | 6644.9 | 8030.1 | 9878.0  | 11624.7 | 12662.1 | 12627.9 | 12023.9 | 11657.4 | 10838.7 |
| 67.5° | 4483.5 | 4409.3 | 4903.9 | 6323.3 | 8363.1  | 10901.5 | 13070.3 | 13113.5 | 12426.3 | 11765.1 | 10450.2 |
| 68°   | 4091.8 | 4113.8 | 4499.0 | 5901.3 | 7966.4  | 10646.1 | 13097.2 | 13163.3 | 12466.2 | 11694.9 | 10237.9 |
| 70°   | 2438.9 | 2481.3 | 2825.0 | 4063.2 | 6060.5  | 9200.5  | 12806.6 | 12957.6 | 12227.9 | 10970.9 | 8855.3  |
| 72.5° | 622.8  | 673.4  | 998.2  | 1818.6 | 3461.6  | 6482.5  | 10810.9 | 11066.4 | 10616.7 | 8900.1  | 5978.1  |
| 75°   | 256.3  | 269.4  | 356.7  | 599.1  | 1289.6  | 2920.5  | 7125.7  | 7672.5  | 7359.9  | 5328.3  | 2701.7  |
| 77.5° | 177.1  | 186.1  | 229.4  | 332.2  | 558.3   | 990.1   | 3493.5  | 3888.5  | 3503.3  | 1818.6  | 589.3   |
| 80°   | 127.3  | 134.7  | 164.1  | 221.2  | 320.8   | 353.4   | 1138.6  | 1316.6  | 1045.6  | 399.1   | 146.1   |
| 82.5° | 75.9   | 81.6   | 122.4  | 157.5  | 195.1   | 169.0   | 283.2   | 321.6   | 302.8   | 198.3   | 65.3    |
| 85°   | 37.5   | 44.1   | 82.4   | 112.6  | 105.3   | 71.0    | 86.5    | 96.3    | 119.2   | 120.8   | 35.1    |
| 87.5° | 2.4    | 4.9    | 48.2   | 67.7   | 29.4    | 16.3    | 25.3    | 31.0    | 42.4    | 59.6    | 14.7    |
| 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: P322337

CATALOG NUMBER: GLEON-SA3D-760-U-T3-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 2051.2 | 2051.2 | 2051.2 | 2051.2 | 2051.2 | 2051.2 | 2051.2 | 2051.2 | 2051.2 | 2051.2 | 2051.2 |
| 2.5°  | 2056.9 | 2057.7 | 2052.0 | 2049.5 | 2051.2 | 2041.4 | 2037.3 | 2038.9 | 2038.9 | 2041.4 | 2037.3 |
| 5°    | 2077.3 | 2077.3 | 2067.5 | 2054.4 | 2047.1 | 2028.3 | 2016.1 | 2012.8 | 2010.4 | 2008.7 | 2005.5 |
| 7.5°  | 2121.4 | 2116.5 | 2099.3 | 2070.8 | 2046.3 | 2005.5 | 1974.5 | 1958.1 | 1950.0 | 1946.7 | 1944.3 |
| 10°   | 2192.4 | 2183.4 | 2154.8 | 2101.8 | 2045.5 | 1972.8 | 1905.1 | 1856.9 | 1816.9 | 1800.6 | 1790.8 |
| 12.5° | 2287.9 | 2274.8 | 2226.7 | 2138.5 | 2039.8 | 1905.9 | 1759.0 | 1617.8 | 1486.4 | 1432.5 | 1405.5 |
| 15°   | 2398.1 | 2379.3 | 2303.4 | 2169.5 | 2006.3 | 1754.9 | 1435.7 | 1188.4 | 1006.4 | 937.8  | 908.5  |
| 17.5° | 2509.9 | 2485.4 | 2370.3 | 2189.1 | 1905.9 | 1442.3 | 1007.2 | 760.7  | 639.1  | 606.5  | 595.0  |
| 20°   | 2622.5 | 2586.6 | 2428.3 | 2174.4 | 1679.0 | 1039.9 | 664.4  | 555.9  | 520.8  | 511.0  | 507.7  |
| 22.5° | 2729.5 | 2674.0 | 2480.5 | 2117.3 | 1329.6 | 697.9  | 525.7  | 491.4  | 479.9  | 474.2  | 472.6  |
| 25°   | 2822.5 | 2745.0 | 2526.2 | 1941.0 | 941.1  | 527.3  | 473.4  | 462.0  | 447.3  | 436.7  | 437.5  |
| 27.5° | 2909.9 | 2816.0 | 2554.0 | 1650.4 | 627.7  | 450.6  | 438.3  | 422.8  | 395.9  | 380.4  | 380.4  |
| 30°   | 3015.1 | 2910.7 | 2574.4 | 1270.1 | 462.0  | 398.3  | 388.5  | 364.9  | 328.1  | 307.7  | 307.7  |
| 32.5° | 3173.5 | 3054.3 | 2561.3 | 891.3  | 382.8  | 350.2  | 327.3  | 294.7  | 254.7  | 235.1  | 234.3  |
| 35°   | 3415.9 | 3276.3 | 2468.3 | 584.4  | 337.9  | 304.5  | 267.7  | 227.7  | 192.6  | 176.3  | 175.5  |
| 37.5° | 3742.4 | 3573.4 | 2259.3 | 417.9  | 302.8  | 262.0  | 217.9  | 173.9  | 147.7  | 137.1  | 136.3  |
| 40°   | 4166.0 | 3918.7 | 1960.6 | 338.7  | 270.2  | 221.2  | 168.1  | 134.7  | 116.7  | 108.6  | 109.4  |
| 42.5° | 4674.5 | 4288.5 | 1602.3 | 292.2  | 238.3  | 182.0  | 131.4  | 106.1  | 94.7   | 89.0   | 87.3   |
| 45°   | 5239.4 | 4653.3 | 1226.8 | 260.4  | 206.5  | 146.9  | 102.8  | 84.1   | 75.1   | 71.8   | 71.8   |
| 47.5° | 5860.5 | 5008.4 | 897.9  | 232.6  | 172.2  | 113.5  | 82.4   | 68.6   | 61.2   | 58.8   | 58.0   |
| 50°   | 6424.5 | 5254.9 | 647.3  | 203.2  | 141.2  | 89.8   | 66.9   | 57.1   | 52.2   | 49.0   | 49.0   |
| 52.5° | 6894.7 | 5332.4 | 476.7  | 171.4  | 114.3  | 71.8   | 55.5   | 49.0   | 44.1   | 41.6   | 41.6   |
| 55°   | 7308.5 | 5300.6 | 354.2  | 141.2  | 92.2   | 58.8   | 47.3   | 41.6   | 37.5   | 35.1   | 35.1   |
| 57.5° | 7705.2 | 5197.7 | 264.5  | 115.1  | 74.3   | 47.3   | 40.0   | 35.1   | 31.0   | 29.4   | 29.4   |
| 60°   | 8029.2 | 5026.3 | 196.7  | 93.0   | 59.6   | 38.4   | 33.5   | 28.6   | 25.3   | 22.9   | 22.9   |
| 62.5° | 8292.1 | 4837.0 | 144.5  | 76.7   | 47.3   | 30.2   | 26.1   | 23.7   | 18.8   | 16.3   | 16.3   |
| 65°   | 8293.7 | 4522.7 | 108.6  | 63.7   | 36.7   | 23.7   | 19.6   | 18.8   | 12.2   | 9.8    | 9.0    |
| 67.5° | 7693.8 | 3899.1 | 83.3   | 54.7   | 28.6   | 18.0   | 14.7   | 15.5   | 6.5    | 4.1    | 3.3    |
| 68°   | 7475.8 | 3740.8 | 78.4   | 53.9   | 26.9   | 17.1   | 13.9   | 15.5   | 5.7    | 3.3    | 2.4    |
| 70°   | 6302.9 | 2976.0 | 62.8   | 52.2   | 23.7   | 13.1   | 11.4   | 15.5   | 4.9    | 2.4    | 1.6    |
| 72.5° | 4031.3 | 1727.1 | 46.5   | 41.6   | 18.0   | 9.8    | 7.3    | 13.9   | 4.9    | 1.6    | 0.8    |
| 75°   | 1715.7 | 535.4  | 31.8   | 29.4   | 10.6   | 7.3    | 4.9    | 9.0    | 3.3    | 0.8    | 0.0    |
| 77.5° | 361.6  | 120.8  | 18.8   | 18.0   | 7.3    | 4.9    | 3.3    | 2.4    | 0.8    | 0.0    | 0.0    |
| 80°   | 93.0   | 35.1   | 9.8    | 9.0    | 4.1    | 2.4    | 1.6    | 0.0    | 0.0    | 0.0    | 0.0    |
| 82.5° | 29.4   | 13.9   | 5.7    | 4.1    | 1.6    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 85°   | 14.7   | 8.2    | 3.3    | 1.6    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 87.5° | 8.2    | 2.4    | 0.8    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 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: SP1-1908-441-9-R4

Test Date: 10/23/2019

Luminaire Tested: SA1C-760-U-5WQ

Data in this report applies to families of products SA1C-760-U-5WQ .

### Test Information

Test Method: LM-79-2008  
 Report Number: SP1-1908-441-9-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-760-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):                  | 5474   | CRI (Ra): | 71.7 |      |       |
| CIE u':                   | 0.2052 | R1:       | 70.6 | R9:  | -27.1 |
| CIE v':                   | 0.4804 | R2:       | 74.6 | R10: | 40.8  |
| Duv:                      | 0.0025 | R3:       | 78.3 | R11: | 74.6  |
| CIE x:                    | 0.3330 | R4:       | 73.8 | R12: | 50.4  |
| CIE y:                    | 0.3466 | R5:       | 72.4 | R13: | 70.0  |
| CIE z:                    | 0.3204 | R6:       | 67.5 | R14: | 87.8  |
| Peak Wavelength (nm):     | 442    | R7:       | 77.5 |      |       |
| Dominant Wavelength (nm): | 554    | R8:       | 58.9 |      |       |
| Purity:                   | 4.1    |           |      |      |       |
| Rf:                       | 72.1   |           |      |      |       |
| Rg:                       | 97.2   |           |      |      |       |



### Test Conditions

Stabilization Time: 240M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 24.6/31%  
 Sphere Temperature (°C): 25.9

REPORT NUMBER: SP1-1908-441-9-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 5700K 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       | 3540             | NR               | 490       | 33363            | NR               | 620       | 80193            | NR               | 750       | 4663             | NR               | 880       | 4678             | NR               |
| 365       | 2862             | NR               | 495       | 44177            | NR               | 625       | 73091            | NR               | 755       | 4147             | NR               | 885       | 4128             | NR               |
| 370       | 2865             | NR               | 500       | 57019            | NR               | 630       | 66269            | NR               | 760       | 4040             | NR               | 890       | 4504             | NR               |
| 375       | 3254             | NR               | 505       | 70030            | NR               | 635       | 60012            | NR               | 765       | 3474             | NR               | 895       | 4371             | NR               |
| 380       | 3076             | NR               | 510       | 81972            | NR               | 640       | 53914            | NR               | 770       | 3469             | NR               | 900       | 4082             | NR               |
| 385       | 2904             | NR               | 515       | 92590            | NR               | 645       | 48385            | NR               | 775       | 3181             | NR               | 905       | 2982             | NR               |
| 390       | 2689             | NR               | 520       | 100305           | NR               | 650       | 43219            | NR               | 780       | 2969             | NR               | 910       | 4351             | NR               |
| 395       | 2619             | NR               | 525       | 107452           | NR               | 655       | 38562            | NR               | 785       | 3132             | NR               | 915       | 3365             | NR               |
| 400       | 2679             | NR               | 530       | 111373           | NR               | 660       | 34110            | NR               | 790       | 2507             | NR               | 920       | 3430             | NR               |
| 405       | 3515             | NR               | 535       | 114505           | NR               | 665       | 30085            | NR               | 795       | 2968             | NR               | 925       | 4264             | NR               |
| 410       | 6934             | NR               | 540       | 116408           | NR               | 670       | 26205            | NR               | 800       | 2758             | NR               | 930       | 4095             | NR               |
| 415       | 14943            | NR               | 545       | 118700           | NR               | 675       | 22906            | NR               | 805       | 2872             | NR               | 935       | 5048             | NR               |
| 420       | 31939            | NR               | 550       | 119209           | NR               | 680       | 20058            | NR               | 810       | 3094             | NR               | 940       | 4074             | NR               |
| 425       | 64701            | NR               | 555       | 120742           | NR               | 685       | 17413            | NR               | 815       | 3222             | NR               | 945       | 4949             | NR               |
| 430       | 110939           | NR               | 560       | 121594           | NR               | 690       | 15447            | NR               | 820       | 3238             | NR               | 950       | 4387             | NR               |
| 435       | 164597           | NR               | 565       | 121913           | NR               | 695       | 13398            | NR               | 825       | 3524             | NR               | 955       | 4978             | NR               |
| 440       | 207696           | NR               | 570       | 122147           | NR               | 700       | 11777            | NR               | 830       | 2921             | NR               | 960       | 4706             | NR               |
| 445       | 201830           | NR               | 575       | 121605           | NR               | 705       | 10412            | NR               | 835       | 3595             | NR               | 965       | 5083             | NR               |
| 450       | 145410           | NR               | 580       | 120248           | NR               | 710       | 9544             | NR               | 840       | 3016             | NR               | 970       | 4522             | NR               |
| 455       | 89594            | NR               | 585       | 117717           | NR               | 715       | 8940             | NR               | 845       | 4032             | NR               | 975       | 4740             | NR               |
| 460       | 58321            | NR               | 590       | 114359           | NR               | 720       | 7897             | NR               | 850       | 3579             | NR               | 980       | 6122             | NR               |
| 465       | 39318            | NR               | 595       | 109974           | NR               | 725       | 7045             | NR               | 855       | 4571             | NR               | 985       | 6450             | NR               |
| 470       | 27693            | NR               | 600       | 105269           | NR               | 730       | 6483             | NR               | 860       | 4485             | NR               | 990       | 4875             | NR               |
| 475       | 23081            | NR               | 605       | 99453            | NR               | 735       | 5838             | NR               | 865       | 3978             | NR               | 995       | 4764             | NR               |
| 480       | 23002            | NR               | 610       | 92921            | NR               | 740       | 5261             | NR               | 870       | 4298             | NR               | 1000      | 3640             | NR               |
| 485       | 26201            | NR               | 615       | 86989            | NR               | 745       | 4760             | NR               | 875       | 4356             | NR               |           |                  |                  |

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**Scotopic Flux vs. Wavelength**



**Scotopic Lumens: 13759.3**

**S/P: 1.85**

| 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       | 3540             | NR               | 490       | 33363            | NR               | 620       | 80193            | NR               | 750       | 4663             | NR               | 880       | 4678             | NR               |
| 365       | 2862             | NR               | 495       | 44177            | NR               | 625       | 73091            | NR               | 755       | 4147             | NR               | 885       | 4128             | NR               |
| 370       | 2865             | NR               | 500       | 57019            | NR               | 630       | 66269            | NR               | 760       | 4040             | NR               | 890       | 4504             | NR               |
| 375       | 3254             | NR               | 505       | 70030            | NR               | 635       | 60012            | NR               | 765       | 3474             | NR               | 895       | 4371             | NR               |
| 380       | 3076             | NR               | 510       | 81972            | NR               | 640       | 53914            | NR               | 770       | 3469             | NR               | 900       | 4082             | NR               |
| 385       | 2904             | NR               | 515       | 92590            | NR               | 645       | 48385            | NR               | 775       | 3181             | NR               | 905       | 2982             | NR               |
| 390       | 2689             | NR               | 520       | 100305           | NR               | 650       | 43219            | NR               | 780       | 2969             | NR               | 910       | 4351             | NR               |
| 395       | 2619             | NR               | 525       | 107452           | NR               | 655       | 38562            | NR               | 785       | 3132             | NR               | 915       | 3365             | NR               |
| 400       | 2679             | NR               | 530       | 111373           | NR               | 660       | 34110            | NR               | 790       | 2507             | NR               | 920       | 3430             | NR               |
| 405       | 3515             | NR               | 535       | 114505           | NR               | 665       | 30085            | NR               | 795       | 2968             | NR               | 925       | 4264             | NR               |
| 410       | 6934             | NR               | 540       | 116408           | NR               | 670       | 26205            | NR               | 800       | 2758             | NR               | 930       | 4095             | NR               |
| 415       | 14943            | NR               | 545       | 118700           | NR               | 675       | 22906            | NR               | 805       | 2872             | NR               | 935       | 5048             | NR               |
| 420       | 31939            | NR               | 550       | 119209           | NR               | 680       | 20058            | NR               | 810       | 3094             | NR               | 940       | 4074             | NR               |
| 425       | 64701            | NR               | 555       | 120742           | NR               | 685       | 17413            | NR               | 815       | 3222             | NR               | 945       | 4949             | NR               |
| 430       | 110939           | NR               | 560       | 121594           | NR               | 690       | 15447            | NR               | 820       | 3238             | NR               | 950       | 4387             | NR               |
| 435       | 164597           | NR               | 565       | 121913           | NR               | 695       | 13398            | NR               | 825       | 3524             | NR               | 955       | 4978             | NR               |
| 440       | 207696           | NR               | 570       | 122147           | NR               | 700       | 11777            | NR               | 830       | 2921             | NR               | 960       | 4706             | NR               |
| 445       | 201830           | NR               | 575       | 121605           | NR               | 705       | 10412            | NR               | 835       | 3595             | NR               | 965       | 5083             | NR               |
| 450       | 145410           | NR               | 580       | 120248           | NR               | 710       | 9544             | NR               | 840       | 3016             | NR               | 970       | 4522             | NR               |
| 455       | 89594            | NR               | 585       | 117717           | NR               | 715       | 8940             | NR               | 845       | 4032             | NR               | 975       | 4740             | NR               |
| 460       | 58321            | NR               | 590       | 114359           | NR               | 720       | 7897             | NR               | 850       | 3579             | NR               | 980       | 6122             | NR               |
| 465       | 39318            | NR               | 595       | 109974           | NR               | 725       | 7045             | NR               | 855       | 4571             | NR               | 985       | 6450             | NR               |
| 470       | 27693            | NR               | 600       | 105269           | NR               | 730       | 6483             | NR               | 860       | 4485             | NR               | 990       | 4875             | NR               |
| 475       | 23081            | NR               | 605       | 99453            | NR               | 735       | 5838             | NR               | 865       | 3978             | NR               | 995       | 4764             | NR               |
| 480       | 23002            | NR               | 610       | 92921            | NR               | 740       | 5261             | NR               | 870       | 4298             | NR               | 1000      | 3640             | NR               |
| 485       | 26201            | NR               | 615       | 86989            | NR               | 745       | 4760             | NR               | 875       | 4356             | NR               |           |                  |                  |

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**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: 5527.6 M/P: 0.74**

| 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       | 3540             | NR               | 490       | 33363            | NR               | 620       | 80193            | NR               | 750       | 4663             | NR               | 880       | 4678             | NR               |
| 365       | 2862             | NR               | 495       | 44177            | NR               | 625       | 73091            | NR               | 755       | 4147             | NR               | 885       | 4128             | NR               |
| 370       | 2865             | NR               | 500       | 57019            | NR               | 630       | 66269            | NR               | 760       | 4040             | NR               | 890       | 4504             | NR               |
| 375       | 3254             | NR               | 505       | 70030            | NR               | 635       | 60012            | NR               | 765       | 3474             | NR               | 895       | 4371             | NR               |
| 380       | 3076             | NR               | 510       | 81972            | NR               | 640       | 53914            | NR               | 770       | 3469             | NR               | 900       | 4082             | NR               |
| 385       | 2904             | NR               | 515       | 92590            | NR               | 645       | 48385            | NR               | 775       | 3181             | NR               | 905       | 2982             | NR               |
| 390       | 2689             | NR               | 520       | 100305           | NR               | 650       | 43219            | NR               | 780       | 2969             | NR               | 910       | 4351             | NR               |
| 395       | 2619             | NR               | 525       | 107452           | NR               | 655       | 38562            | NR               | 785       | 3132             | NR               | 915       | 3365             | NR               |
| 400       | 2679             | NR               | 530       | 111373           | NR               | 660       | 34110            | NR               | 790       | 2507             | NR               | 920       | 3430             | NR               |
| 405       | 3515             | NR               | 535       | 114505           | NR               | 665       | 30085            | NR               | 795       | 2968             | NR               | 925       | 4264             | NR               |
| 410       | 6934             | NR               | 540       | 116408           | NR               | 670       | 26205            | NR               | 800       | 2758             | NR               | 930       | 4095             | NR               |
| 415       | 14943            | NR               | 545       | 118700           | NR               | 675       | 22906            | NR               | 805       | 2872             | NR               | 935       | 5048             | NR               |
| 420       | 31939            | NR               | 550       | 119209           | NR               | 680       | 20058            | NR               | 810       | 3094             | NR               | 940       | 4074             | NR               |
| 425       | 64701            | NR               | 555       | 120742           | NR               | 685       | 17413            | NR               | 815       | 3222             | NR               | 945       | 4949             | NR               |
| 430       | 110939           | NR               | 560       | 121594           | NR               | 690       | 15447            | NR               | 820       | 3238             | NR               | 950       | 4387             | NR               |
| 435       | 164597           | NR               | 565       | 121913           | NR               | 695       | 13398            | NR               | 825       | 3524             | NR               | 955       | 4978             | NR               |
| 440       | 207696           | NR               | 570       | 122147           | NR               | 700       | 11777            | NR               | 830       | 2921             | NR               | 960       | 4706             | NR               |
| 445       | 201830           | NR               | 575       | 121605           | NR               | 705       | 10412            | NR               | 835       | 3595             | NR               | 965       | 5083             | NR               |
| 450       | 145410           | NR               | 580       | 120248           | NR               | 710       | 9544             | NR               | 840       | 3016             | NR               | 970       | 4522             | NR               |
| 455       | 89594            | NR               | 585       | 117717           | NR               | 715       | 8940             | NR               | 845       | 4032             | NR               | 975       | 4740             | NR               |
| 460       | 58321            | NR               | 590       | 114359           | NR               | 720       | 7897             | NR               | 850       | 3579             | NR               | 980       | 6122             | NR               |
| 465       | 39318            | NR               | 595       | 109974           | NR               | 725       | 7045             | NR               | 855       | 4571             | NR               | 985       | 6450             | NR               |
| 470       | 27693            | NR               | 600       | 105269           | NR               | 730       | 6483             | NR               | 860       | 4485             | NR               | 990       | 4875             | NR               |
| 475       | 23081            | NR               | 605       | 99453            | NR               | 735       | 5838             | NR               | 865       | 3978             | NR               | 995       | 4764             | NR               |
| 480       | 23002            | NR               | 610       | 92921            | NR               | 740       | 5261             | NR               | 870       | 4298             | NR               | 1000      | 3640             | NR               |
| 485       | 26201            | NR               | 615       | 86989            | NR               | 745       | 4760             | NR               | 875       | 4356             | NR               |           |                  |                  |

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**Summary**

$R_f = 72.1$   
 $R_g = 97.2$   
 CIE  $R_a = 71.7$   
 $R_g = -27.1$



**Color Vector Graphics**



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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 54 | CES51 = 88 | CES76 = 43 |
| CES02 = 59 | CES27 = 79 | CES52 = 90 | CES77 = 64 |
| CES03 = 30 | CES28 = 77 | CES53 = 77 | CES78 = 46 |
| CES04 = 69 | CES29 = 50 | CES54 = 81 | CES79 = 74 |
| CES05 = 46 | CES30 = 59 | CES55 = 80 | CES80 = 70 |
| CES06 = 50 | CES31 = 55 | CES56 = 70 | CES81 = 71 |
| CES07 = 38 | CES32 = 52 | CES57 = 68 | CES82 = 88 |
| CES08 = 38 | CES33 = 63 | CES58 = 70 | CES83 = 82 |
| CES09 = 29 | CES34 = 63 | CES59 = 88 | CES84 = 87 |
| CES10 = 72 | CES35 = 79 | CES60 = 92 | CES85 = 84 |
| CES11 = 55 | CES36 = 90 | CES61 = 88 | CES86 = 76 |
| CES12 = 61 | CES37 = 72 | CES62 = 81 | CES87 = 75 |
| CES13 = 41 | CES38 = 68 | CES63 = 75 | CES88 = 77 |
| CES14 = 74 | CES39 = 91 | CES64 = 72 | CES89 = 76 |
| CES15 = 70 | CES40 = 83 | CES65 = 65 | CES90 = 76 |
| CES16 = 46 | CES41 = 84 | CES66 = 66 | CES91 = 92 |
| CES17 = 48 | CES42 = 70 | CES67 = 64 | CES92 = 70 |
| CES18 = 55 | CES43 = 69 | CES68 = 71 | CES93 = 83 |
| CES19 = 70 | CES44 = 98 | CES69 = 80 | CES94 = 60 |
| CES20 = 64 | CES45 = 79 | CES70 = 58 | CES95 = 73 |
| CES21 = 85 | CES46 = 78 | CES71 = 55 | CES96 = 79 |
| CES22 = 77 | CES47 = 76 | CES72 = 84 | CES97 = 84 |
| CES23 = 91 | CES48 = 68 | CES73 = 47 | CES98 = 73 |
| CES24 = 90 | CES49 = 78 | CES74 = 94 | CES99 = 62 |
| CES25 = 71 | CES50 = 87 | CES75 = 51 |            |



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Color Rendition by Hue-Angle Bin



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**Measure Comparisons**



(END OF REPORT)