

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: P319254

Luminaire Tested: **GLEON-SA0C-722-U-T4W**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P319254  
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-SA0C-722-U-T4W  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(10) 70 CRI, 2200K, 1050mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE IV  
WIDE OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 51106 lumens  
Efficiency: N/A  
Efficacy: 91.6 lumens/watt  
Luminous Opening: Rectangular (W 2.5' x L: 1' x H: 0')  
IES Classification: Type IV - Short  
BUG Rating: B4 - U0 - G5

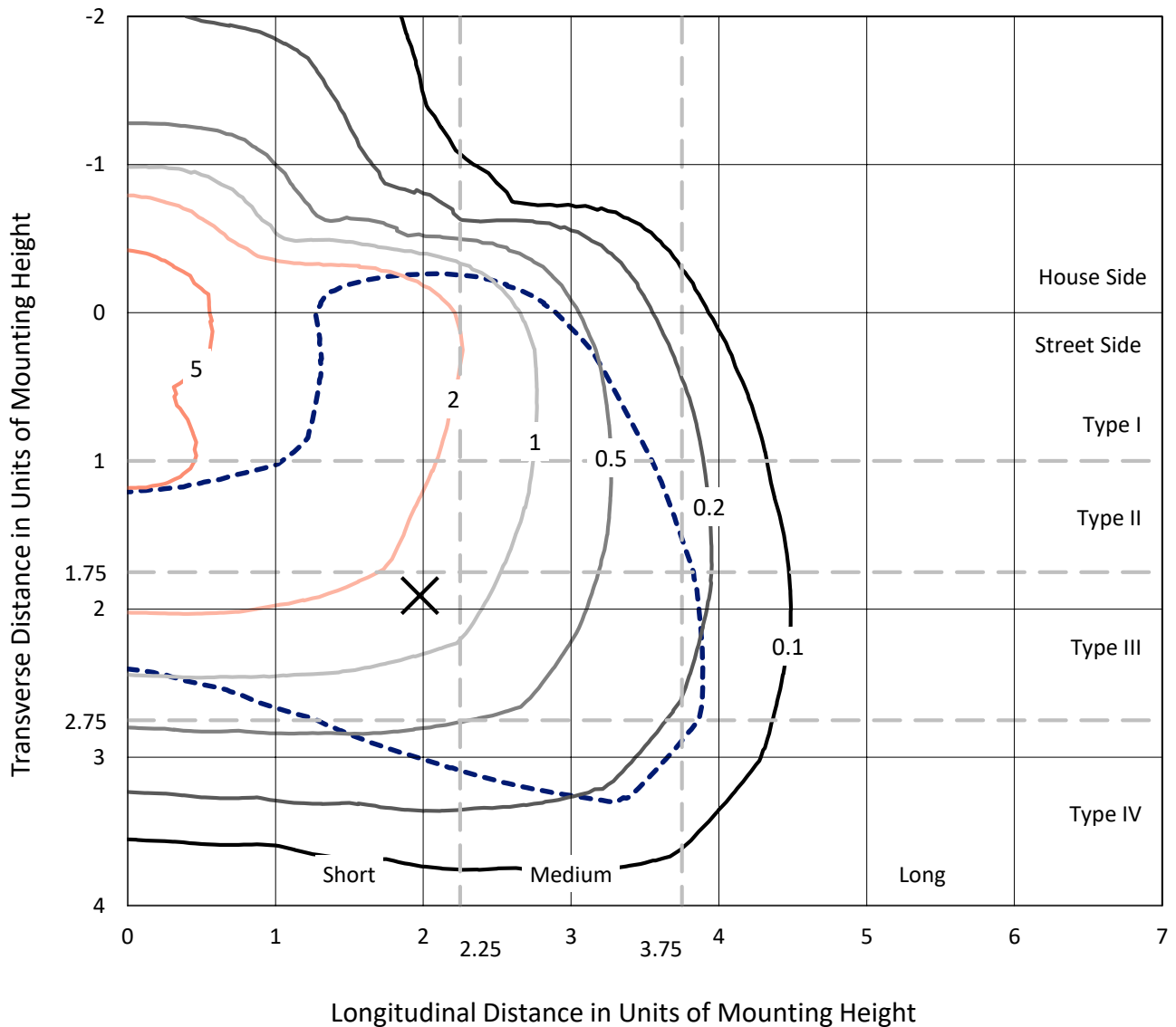
Input Watts (W): 558  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



REPORT NUMBER: P319254  
 CATALOG NUMBER: GLEON-SA0C-722-U-T4W

### Iso-Footcandle Lines of Horizontal Illumination

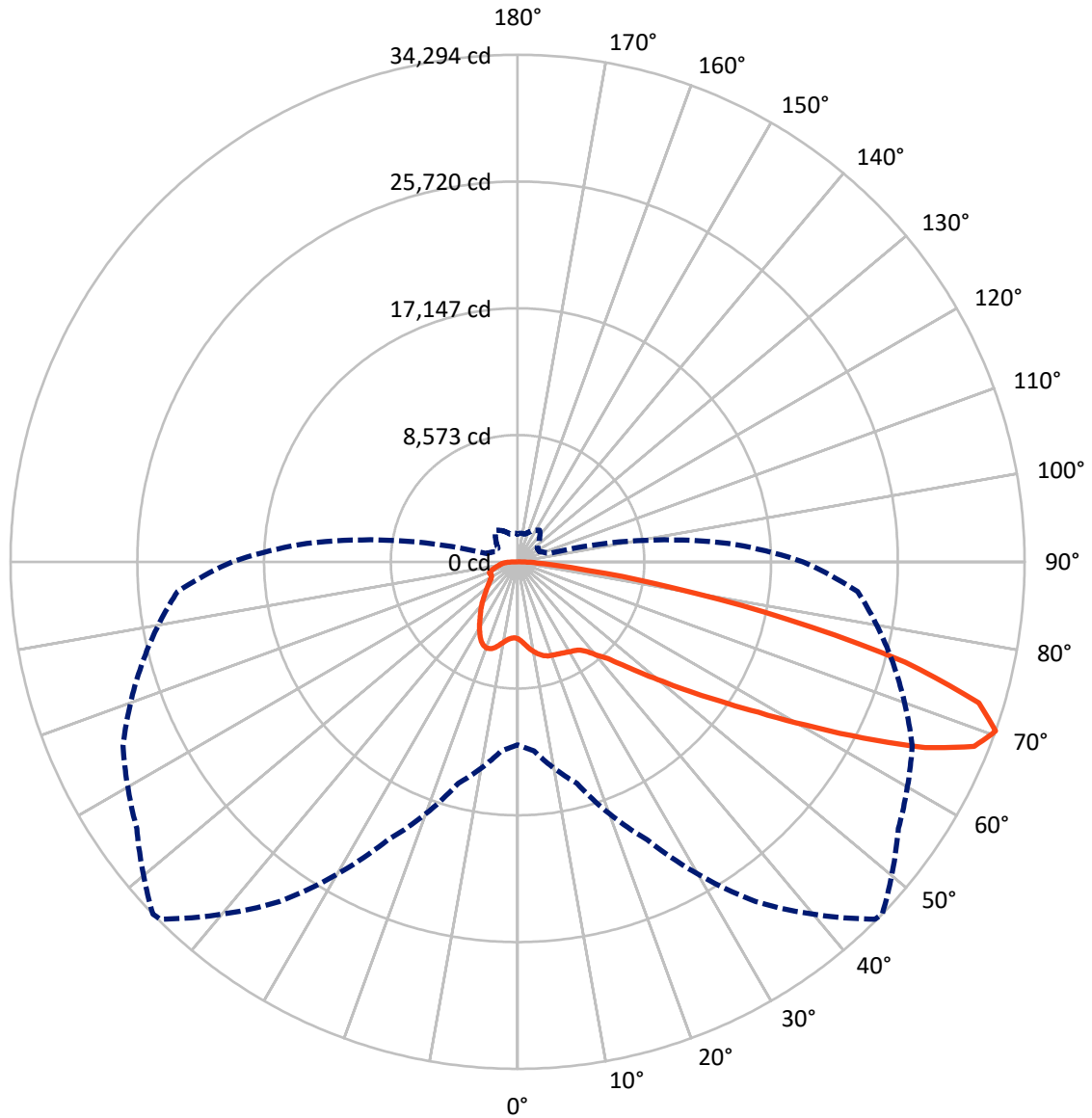
✕ Max cd  
 - - - 1/2 Max cd



Based on 30 foot mounting height. Maximum calculated value = 7.2 fc  
 Type IV - Short - N/A

REPORT NUMBER: P319254  
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### Luminous Intensity Polar Plot



— Vertical Plane Through 46-Deg Lateral      - - - Horizontal Cone Through 70-Deg Vertical

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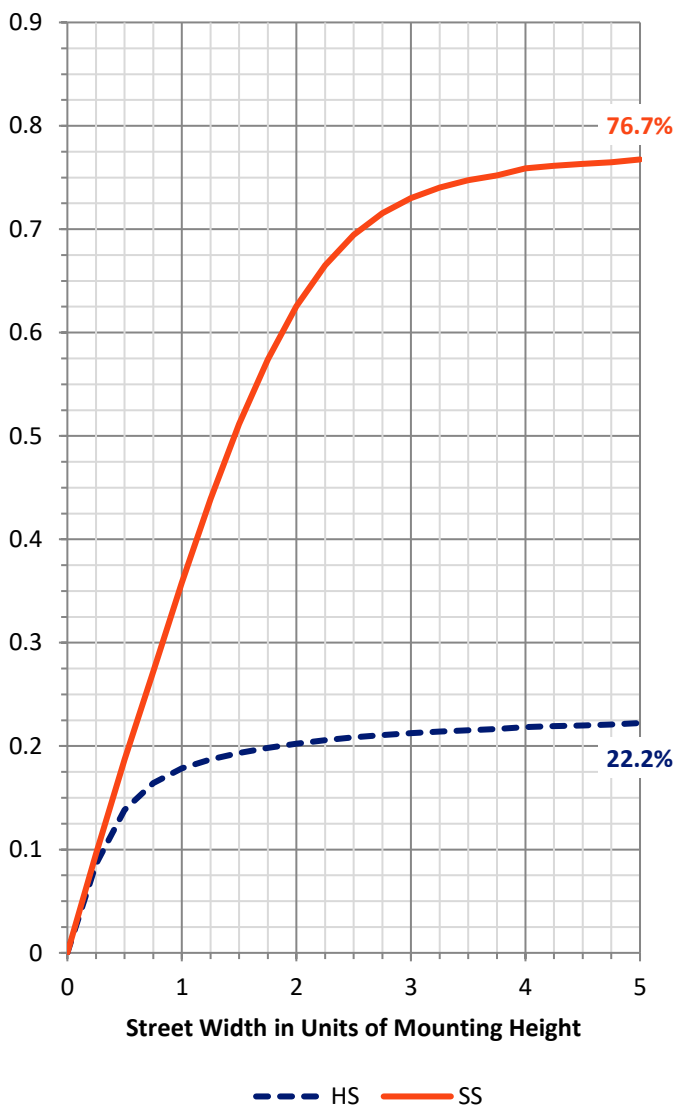
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 11713.3  | 0.0    | 11713.3 |
|                    | % Fixture | 22.9     | 0.0    | 22.9    |
| <b>Street Side</b> | Lumens    | 39392.7  | 0.0    | 39392.7 |
|                    | % Fixture | 77.1     | 0.0    | 77.1    |
| <b>Total</b>       | Lumens    | 51106.0  | 0.0    | 51106.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 530.8   | 1.0       |
| 10°-20°   | 1768.4  | 3.5       |
| 20°-30°   | 2948.6  | 5.8       |
| 30°-40°   | 4184.3  | 8.2       |
| 40°-50°   | 6154.9  | 12.0      |
| 50°-60°   | 10423.2 | 20.4      |
| 60°-70°   | 14795.6 | 29.0      |
| 70°-80°   | 8988.5  | 17.6      |
| 80°-90°   | 1311.8  | 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°    | 51106.0 | 100.0     |
| 0°-180°   | 51106.0 | 100.0     |

**Coefficient of Utilization**



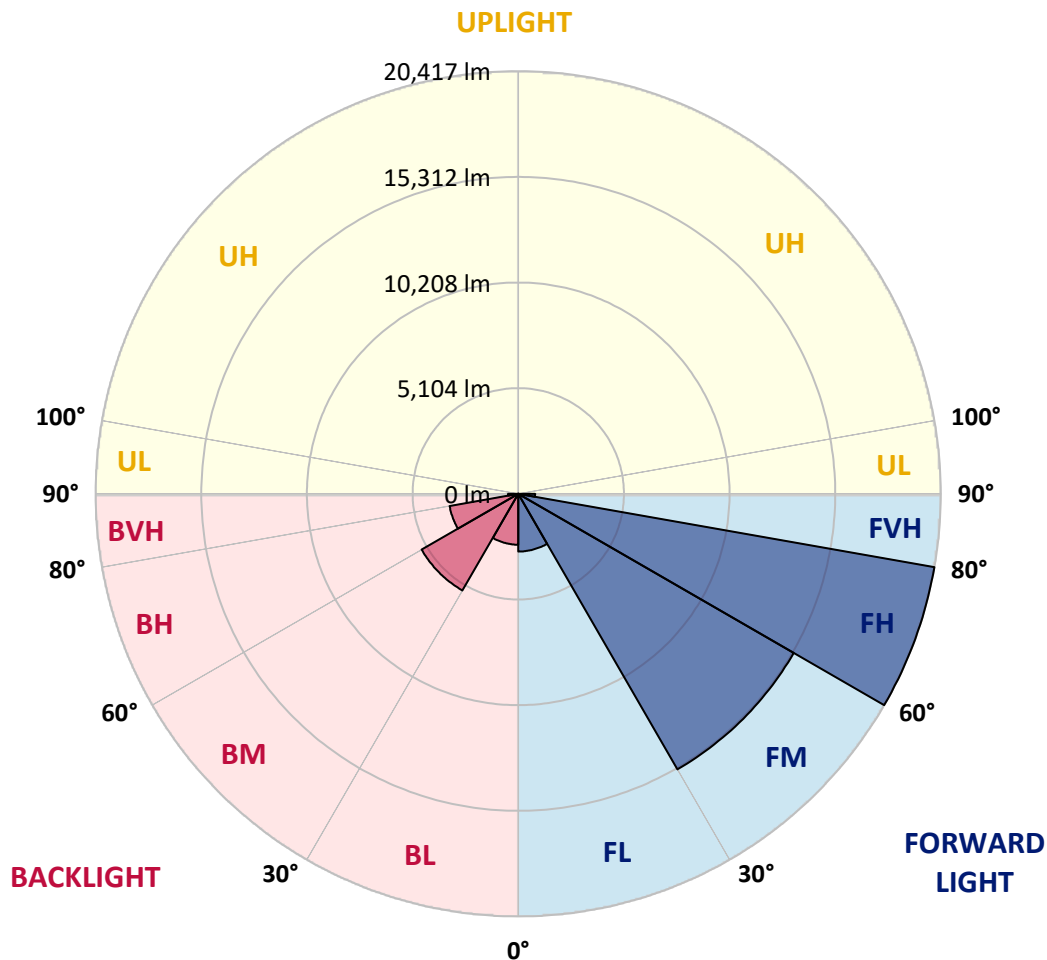
REPORT NUMBER: P319254  
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**LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:**

| Zone           | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |         |
|----------------|---------|-----------|-------------------------|------|---------|
|                |         |           | B                       | U    | G       |
| FL (0°-30°)    | 2788.6  | 5.5       |                         |      |         |
| FM (30°-60°)   | 15370.4 | 30.1      |                         |      |         |
| FH (60°-80°)   | 20416.6 | 39.9      |                         |      | G5      |
| FVH (80°-90°)  | 817.1   | 1.6       |                         |      | G5      |
| BL (0°-30°)    | 2459.2  | 4.8       | B3/2500                 |      |         |
| BM (30°-60°)   | 5392.0  | 10.6      | B4/8500                 |      |         |
| BH (60°-80°)   | 3367.5  | 6.6       | B4/5000                 |      | G4/5000 |
| BVH (80°-90°)  | 494.6   | 1.0       |                         |      | G3/500  |
| 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: P319254

CATALOG NUMBER: GLEON-SA0C-722-U-T4W

**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 45°     | 46°     | 55°     | 65°     | 75°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 5206.7  | 5206.7  | 5206.7  | 5206.7  | 5206.7  | 5206.7  | 5206.7  | 5206.7  | 5206.7  | 5206.7  | 5206.7  |
| 2.5°  | 5467.3  | 5470.8  | 5477.8  | 5460.3  | 5411.3  | 5397.3  | 5392.1  | 5341.4  | 5308.1  | 5259.2  | 5217.2  |
| 5°    | 5904.5  | 5908.0  | 5897.5  | 5848.6  | 5740.1  | 5659.7  | 5652.7  | 5537.3  | 5432.3  | 5320.4  | 5236.4  |
| 7.5°  | 6361.0  | 6366.3  | 6333.0  | 6240.3  | 6088.2  | 5948.3  | 5939.5  | 5782.1  | 5623.0  | 5453.3  | 5327.4  |
| 10°   | 6765.0  | 6744.1  | 6689.8  | 6560.4  | 6380.3  | 6208.9  | 6201.9  | 6037.5  | 5853.8  | 5649.2  | 5481.3  |
| 12.5° | 7034.4  | 7016.9  | 6946.9  | 6789.5  | 6591.9  | 6434.5  | 6420.5  | 6268.3  | 6089.9  | 5866.1  | 5664.9  |
| 15°   | 7183.0  | 7195.3  | 7100.8  | 6922.4  | 6730.1  | 6597.1  | 6584.9  | 6476.5  | 6317.3  | 6091.7  | 5860.8  |
| 17.5° | 7202.3  | 7212.8  | 7121.8  | 6945.2  | 6787.8  | 6696.8  | 6691.6  | 6619.9  | 6504.4  | 6287.6  | 6046.2  |
| 20°   | 7090.3  | 7097.3  | 7022.1  | 6877.0  | 6773.8  | 6745.8  | 6744.1  | 6712.6  | 6626.9  | 6434.5  | 6200.1  |
| 22.5° | 6927.7  | 6932.9  | 6878.7  | 6773.8  | 6738.8  | 6782.5  | 6794.8  | 6782.5  | 6721.3  | 6541.2  | 6320.8  |
| 25°   | 6887.5  | 6884.0  | 6828.0  | 6721.3  | 6751.0  | 6843.7  | 6859.5  | 6864.7  | 6822.8  | 6665.3  | 6474.7  |
| 27.5° | 7081.6  | 7069.4  | 6962.7  | 6791.3  | 6810.5  | 6922.4  | 6943.4  | 6994.2  | 6967.9  | 6829.8  | 6649.6  |
| 30°   | 7643.0  | 7622.0  | 7403.4  | 7057.1  | 6962.7  | 7020.4  | 7046.6  | 7127.1  | 7132.3  | 7016.9  | 6882.2  |
| 32.5° | 8591.0  | 8564.7  | 8173.0  | 7553.8  | 7219.8  | 7120.1  | 7144.6  | 7265.2  | 7330.0  | 7240.8  | 7095.6  |
| 35°   | 9789.0  | 9759.3  | 9245.1  | 8398.6  | 7650.0  | 7310.7  | 7328.2  | 7424.4  | 7553.8  | 7427.9  | 7235.5  |
| 37.5° | 11037.8 | 10966.1 | 10471.1 | 9392.0  | 8333.9  | 7718.2  | 7718.2  | 7730.5  | 7791.7  | 7529.3  | 7399.9  |
| 40°   | 12279.6 | 12207.9 | 11760.1 | 10560.3 | 9218.9  | 8360.1  | 8319.9  | 8048.8  | 7999.8  | 7774.2  | 7730.5  |
| 42.5° | 13433.9 | 13412.9 | 13148.8 | 11880.8 | 10257.7 | 8991.5  | 8935.5  | 8475.5  | 8486.0  | 8346.1  | 8347.9  |
| 45°   | 14661.7 | 14661.7 | 14446.5 | 13213.5 | 11468.0 | 10005.9 | 9949.9  | 9273.1  | 9378.0  | 9313.3  | 9469.0  |
| 47.5° | 15663.8 | 15695.3 | 15665.6 | 14602.2 | 12876.0 | 11294.9 | 11193.4 | 10378.4 | 10672.3 | 10894.4 | 11347.4 |
| 50°   | 16687.0 | 16735.9 | 16741.2 | 16125.6 | 14577.7 | 12827.0 | 12711.6 | 11845.8 | 12501.7 | 13138.3 | 14028.5 |
| 52.5° | 18171.9 | 18282.0 | 17843.1 | 17645.4 | 16662.5 | 14645.9 | 14532.2 | 13733.0 | 14827.8 | 15721.5 | 17255.4 |
| 55°   | 19548.3 | 19452.1 | 19139.0 | 19261.5 | 18894.2 | 16716.7 | 16631.0 | 15929.7 | 17419.8 | 18581.1 | 20573.2 |
| 57.5° | 20293.4 | 20286.4 | 20601.2 | 21125.9 | 21300.8 | 19270.2 | 19198.5 | 18516.4 | 20342.3 | 21215.1 | 23688.1 |
| 60°   | 21167.9 | 21180.1 | 21960.1 | 23151.2 | 23871.8 | 22449.9 | 22418.4 | 21900.7 | 23180.9 | 23674.1 | 26131.4 |
| 62.5° | 21290.3 | 21510.7 | 22853.9 | 24903.7 | 26278.4 | 26164.7 | 26234.6 | 24949.1 | 25720.4 | 25636.5 | 27955.6 |
| 65°   | 19882.4 | 20172.7 | 22603.8 | 25433.6 | 28671.0 | 30227.5 | 30292.3 | 28015.1 | 27723.0 | 27313.8 | 28608.0 |
| 67.5° | 16996.5 | 17426.8 | 20067.7 | 24281.0 | 29459.7 | 33230.5 | 33321.5 | 30392.0 | 29384.5 | 27882.2 | 27037.4 |
| 70°   | 12368.8 | 12846.2 | 15504.7 | 20737.6 | 28053.6 | 34190.7 | 34293.9 | 31443.1 | 29447.5 | 26264.4 | 23081.2 |
| 72.5° | 7471.6  | 7845.9  | 10037.4 | 15266.8 | 23677.6 | 32441.8 | 32625.4 | 30110.4 | 26885.3 | 22247.0 | 17043.8 |
| 75°   | 3281.1  | 3525.9  | 4853.4  | 8797.3  | 16951.1 | 26841.5 | 27070.6 | 25772.9 | 21844.7 | 16167.5 | 10074.1 |
| 77.5° | 1397.4  | 1467.4  | 1990.3  | 3821.5  | 9582.6  | 18341.5 | 18656.3 | 18831.2 | 14820.8 | 8797.3  | 4257.0  |
| 80°   | 871.0   | 899.0   | 1126.3  | 1729.7  | 4484.4  | 10301.5 | 10640.8 | 11079.8 | 7359.7  | 3233.9  | 1486.6  |
| 82.5° | 529.9   | 561.4   | 748.6   | 1045.9  | 2334.9  | 4669.8  | 4832.4  | 5142.0  | 2856.1  | 1397.4  | 769.5   |
| 85°   | 318.3   | 341.1   | 458.2   | 661.1   | 1329.2  | 1836.4  | 1834.7  | 2028.8  | 1345.0  | 899.0   | 405.8   |
| 87.5° | 152.2   | 169.7   | 244.9   | 342.8   | 669.9   | 689.1   | 645.4   | 731.1   | 816.8   | 589.4   | 204.6   |
| 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: P319254  
 CATALOG NUMBER: GLEON-SA0C-722-U-T4W

**CANDELA DISTRIBUTION (continued):**

|       | 90°     | 95°     | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|---------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 5206.7  | 5206.7  | 5206.7 | 5206.7 | 5206.7 | 5206.7 | 5206.7 | 5206.7 | 5206.7 | 5206.7 | 5206.7 |
| 2.5°  | 5203.2  | 5196.2  | 5173.5 | 5156.0 | 5152.5 | 5142.0 | 5133.2 | 5138.5 | 5145.5 | 5147.2 | 5147.2 |
| 5°    | 5201.5  | 5182.2  | 5152.5 | 5140.2 | 5156.0 | 5177.0 | 5203.2 | 5238.2 | 5259.2 | 5274.9 | 5285.4 |
| 7.5°  | 5285.4  | 5248.7  | 5215.4 | 5208.5 | 5239.9 | 5295.9 | 5355.4 | 5428.8 | 5479.5 | 5514.5 | 5521.5 |
| 10°   | 5425.3  | 5379.8  | 5346.6 | 5353.6 | 5409.6 | 5490.0 | 5574.0 | 5668.4 | 5745.4 | 5792.6 | 5796.1 |
| 12.5° | 5586.2  | 5542.5  | 5511.0 | 5540.8 | 5633.5 | 5731.4 | 5818.8 | 5901.0 | 5971.0 | 6018.2 | 6018.2 |
| 15°   | 5771.6  | 5740.1  | 5703.4 | 5771.6 | 5897.5 | 5985.0 | 6021.7 | 6062.0 | 6100.4 | 6135.4 | 6128.4 |
| 17.5° | 5950.0  | 5920.3  | 5901.0 | 5981.5 | 6112.7 | 6152.9 | 6128.4 | 6098.7 | 6098.7 | 6117.9 | 6121.4 |
| 20°   | 6103.9  | 6077.7  | 6089.9 | 6168.6 | 6236.8 | 6194.9 | 6103.9 | 6009.5 | 5971.0 | 5981.5 | 5992.0 |
| 22.5° | 6238.6  | 6226.4  | 6263.1 | 6299.8 | 6250.8 | 6103.9 | 5936.0 | 5808.3 | 5761.1 | 5757.6 | 5761.1 |
| 25°   | 6396.0  | 6394.3  | 6439.7 | 6373.3 | 6156.4 | 5885.3 | 5659.7 | 5535.5 | 5509.3 | 5530.3 | 5565.2 |
| 27.5° | 6591.9  | 6611.1  | 6633.9 | 6390.8 | 5964.0 | 5554.7 | 5325.6 | 5239.9 | 5266.2 | 5316.9 | 5350.1 |
| 30°   | 6842.0  | 6894.5  | 6845.5 | 6347.0 | 5687.7 | 5177.0 | 4958.3 | 4933.9 | 5005.6 | 5077.3 | 5112.3 |
| 32.5° | 7085.1  | 7167.3  | 7048.4 | 6233.3 | 5330.9 | 4776.5 | 4606.8 | 4599.8 | 4687.3 | 4757.2 | 4806.2 |
| 35°   | 7281.0  | 7443.6  | 7200.5 | 6007.7 | 4918.1 | 4407.4 | 4283.2 | 4236.0 | 4267.5 | 4349.7 | 4405.7 |
| 37.5° | 7536.3  | 7807.4  | 7305.5 | 5663.2 | 4470.4 | 4103.1 | 3957.9 | 3849.5 | 3821.5 | 3854.7 | 3882.7 |
| 40°   | 8003.3  | 8361.9  | 7354.4 | 5182.2 | 4033.1 | 3798.8 | 3651.9 | 3492.7 | 3382.5 | 3302.1 | 3303.8 |
| 42.5° | 8765.9  | 9084.2  | 7323.0 | 4598.1 | 3629.1 | 3501.4 | 3335.3 | 3151.7 | 2973.3 | 2791.4 | 2777.4 |
| 45°   | 10004.1 | 10158.1 | 7228.5 | 3978.9 | 3274.1 | 3190.1 | 3034.5 | 2850.8 | 2613.0 | 2406.6 | 2387.4 |
| 47.5° | 11985.7 | 11644.7 | 7081.6 | 3438.5 | 2961.0 | 2926.0 | 2782.6 | 2571.0 | 2319.1 | 2153.0 | 2139.0 |
| 50°   | 14687.9 | 13790.7 | 7009.9 | 3008.2 | 2684.7 | 2695.2 | 2578.0 | 2354.1 | 2116.3 | 1993.8 | 1979.8 |
| 52.5° | 17920.0 | 16290.0 | 7148.1 | 2675.9 | 2462.6 | 2499.3 | 2411.8 | 2202.0 | 2002.6 | 1906.4 | 1892.4 |
| 55°   | 21272.8 | 18878.4 | 7296.7 | 2434.6 | 2252.7 | 2324.4 | 2294.7 | 2121.5 | 1941.4 | 1852.2 | 1839.9 |
| 57.5° | 24142.9 | 20811.1 | 6999.4 | 2238.7 | 2065.5 | 2177.5 | 2203.7 | 2070.8 | 1909.9 | 1829.4 | 1815.4 |
| 60°   | 25949.6 | 21589.4 | 6219.4 | 2055.0 | 1916.9 | 2060.3 | 2151.2 | 2056.8 | 1922.1 | 1915.1 | 1904.6 |
| 62.5° | 26806.6 | 21521.1 | 5049.3 | 1909.9 | 1824.2 | 2009.6 | 2189.7 | 2135.5 | 2062.0 | 2125.0 | 2130.3 |
| 65°   | 26421.8 | 20492.7 | 3760.3 | 1813.7 | 1757.7 | 2028.8 | 2305.2 | 2284.2 | 2102.3 | 2165.2 | 2174.0 |
| 67.5° | 23889.3 | 18038.9 | 2784.4 | 1729.7 | 1684.3 | 2083.0 | 2515.0 | 2333.1 | 2023.6 | 2069.0 | 2041.1 |
| 70°   | 19308.7 | 14301.4 | 2147.7 | 1635.3 | 1609.1 | 2076.0 | 2609.5 | 2303.4 | 1937.9 | 1948.4 | 1873.2 |
| 72.5° | 13315.0 | 9752.3  | 1747.2 | 1547.8 | 1500.6 | 1892.4 | 2543.0 | 2229.9 | 1866.2 | 1785.7 | 1686.0 |
| 75°   | 7240.8  | 5234.7  | 1484.9 | 1456.9 | 1310.0 | 1661.5 | 2420.6 | 2177.5 | 1801.4 | 1694.8 | 1638.8 |
| 77.5° | 2849.1  | 2172.2  | 1289.0 | 1332.7 | 1145.6 | 1467.4 | 2284.2 | 2077.8 | 1712.2 | 1572.3 | 1544.3 |
| 80°   | 1163.1  | 1108.9  | 1068.6 | 1152.6 | 984.7  | 1283.7 | 2119.8 | 1960.6 | 1605.6 | 1458.6 | 1402.7 |
| 82.5° | 659.4   | 689.1   | 830.8  | 909.5  | 799.3  | 1182.3 | 2041.1 | 1866.2 | 1477.9 | 1306.5 | 1240.0 |
| 85°   | 337.6   | 404.0   | 578.9  | 652.4  | 587.7  | 1005.7 | 1880.1 | 1633.5 | 1185.8 | 1000.4 | 1005.7 |
| 87.5° | 162.7   | 225.6   | 365.5  | 409.3  | 381.3  | 727.6  | 1404.4 | 1184.1 | 923.5  | 731.1  | 708.3  |
| 90°   | 0.0     | 0.0     | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |



Signify Classified - Internal  
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1121 Highway 74 South  
Peachtree City, GA 30269



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

Report Prepared for

Cooper Lighting Solutions

McGRAW-EDISON

Report Number: SP1-1908-441-10-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: 4π  
 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  
 CIE u': 0.2876  
 CIE v': 0.5346  
 Duv: -0.0006  
 CIE x: 0.5005  
 CIE y: 0.4134  
 CIE z: 0.0860  
 Peak Wavelength (nm): 603  
 Dominant Wavelength (nm): 587  
 Purity: 74.5  
 Rf: 69.8  
 Rg: 99.2

|           |      |      |       |
|-----------|------|------|-------|
| CRI (Ra): | 72.0 |      |       |
| R1:       | 68.9 | R9:  | -17.4 |
| R2:       | 83.0 | R10: | 61.3  |
| R3:       | 95.2 | R11: | 59.8  |
| R4:       | 66.2 | R12: | 50.5  |
| R5:       | 65.9 | R13: | 71.1  |
| R6:       | 76.3 | R14: | 96.9  |
| R7:       | 76.7 |      |       |
| R8:       | 43.8 |      |       |



**Test Conditions**

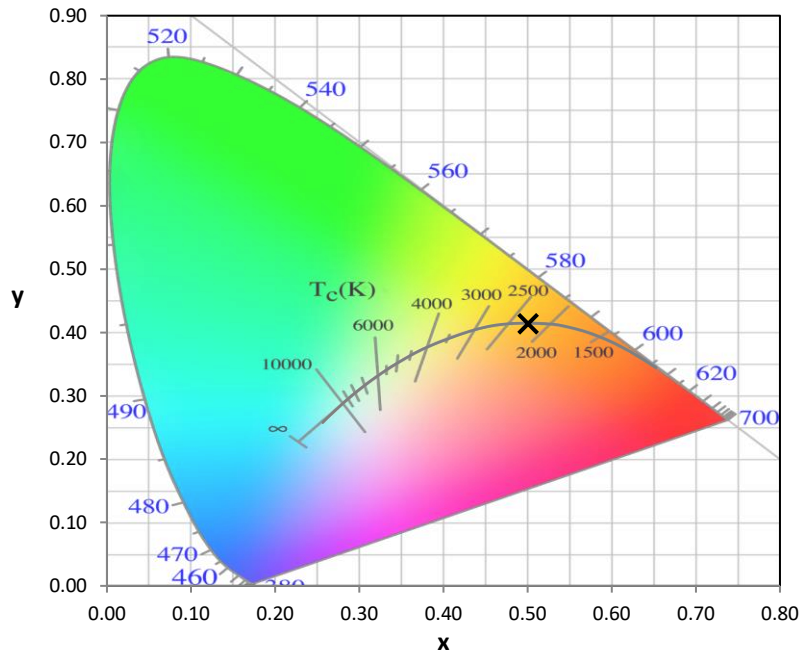
Stabilization Time: 71M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 24.7/41%  
 Sphere Temperature (°C): 25.6

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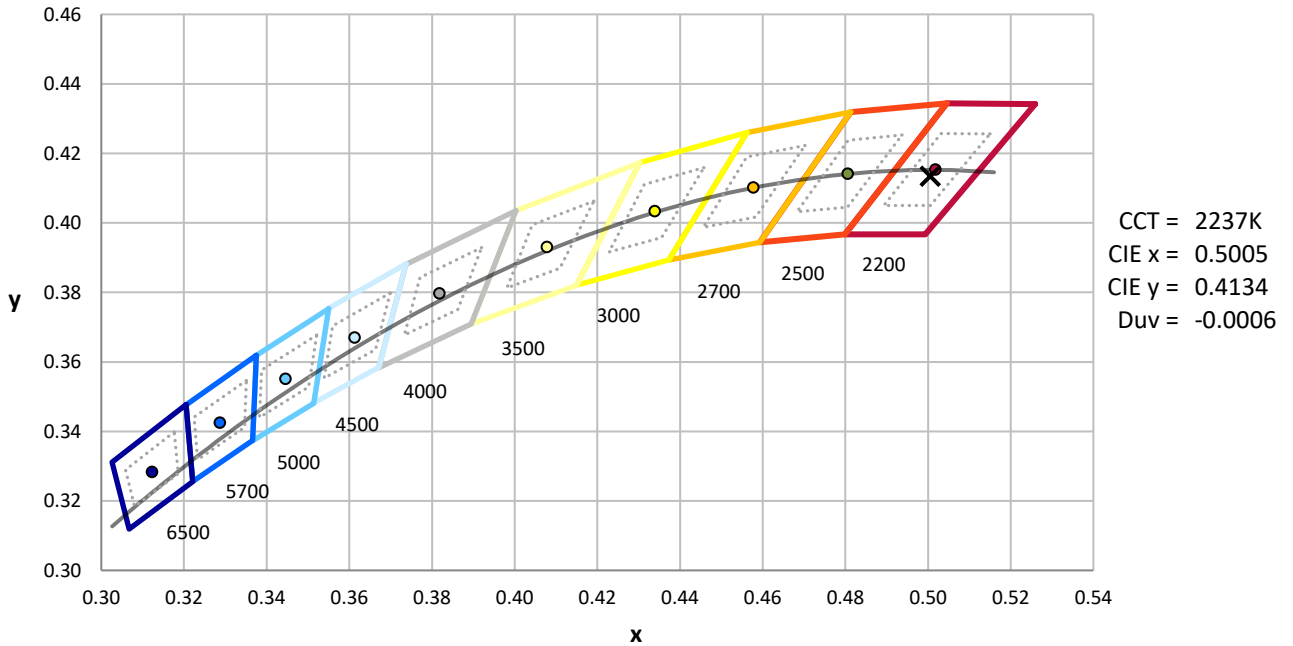
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| 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 2200K 4-step quadrangle

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**Photopic Flux vs. Wavelength**



#####

| $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) |
|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|
| 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                             |                   |                                      |                                |

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Scotopic Flux vs. Wavelength



Scotopic Lumens: 4696.9

S/P: 0.85

| λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) |
|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|
| 360    | 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            |        |               |               |

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**Melanopic Flux vs. Wavelength**



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

| λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) |
|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|
| 360    | 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            |        |               |               |

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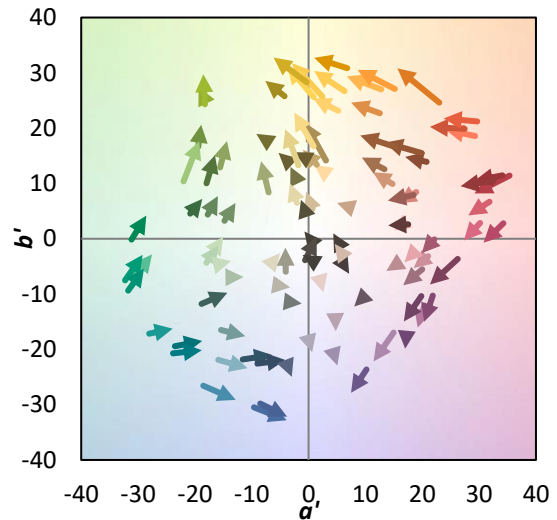
TM-30-18

**Summary**

$R_f = 69.8$   
 $R_g = 99.2$   
 $CIE R_a = 72.0$   
 $R_9 = -17.4$



**Color Vector Graphics**





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**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 |            |



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Color Rendition by Hue-Angle Bin



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Measure Comparisons



(END OF REPORT)