

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: P318182

Luminaire Tested: **GLEON-SA8D-760-U-T2**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P318182  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-12)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA8D-760-U-T2  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(8) 70 CRI, 5700K, 1200mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE II OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 61023 lumens  
Efficiency: N/A  
Efficacy: 119.4 lumens/watt  
Luminous Opening: Rectangular (W 2' x L: 1' x H: 0')  
IES Classification: Type III - Medium  
BUG Rating: B4 - U0 - G5

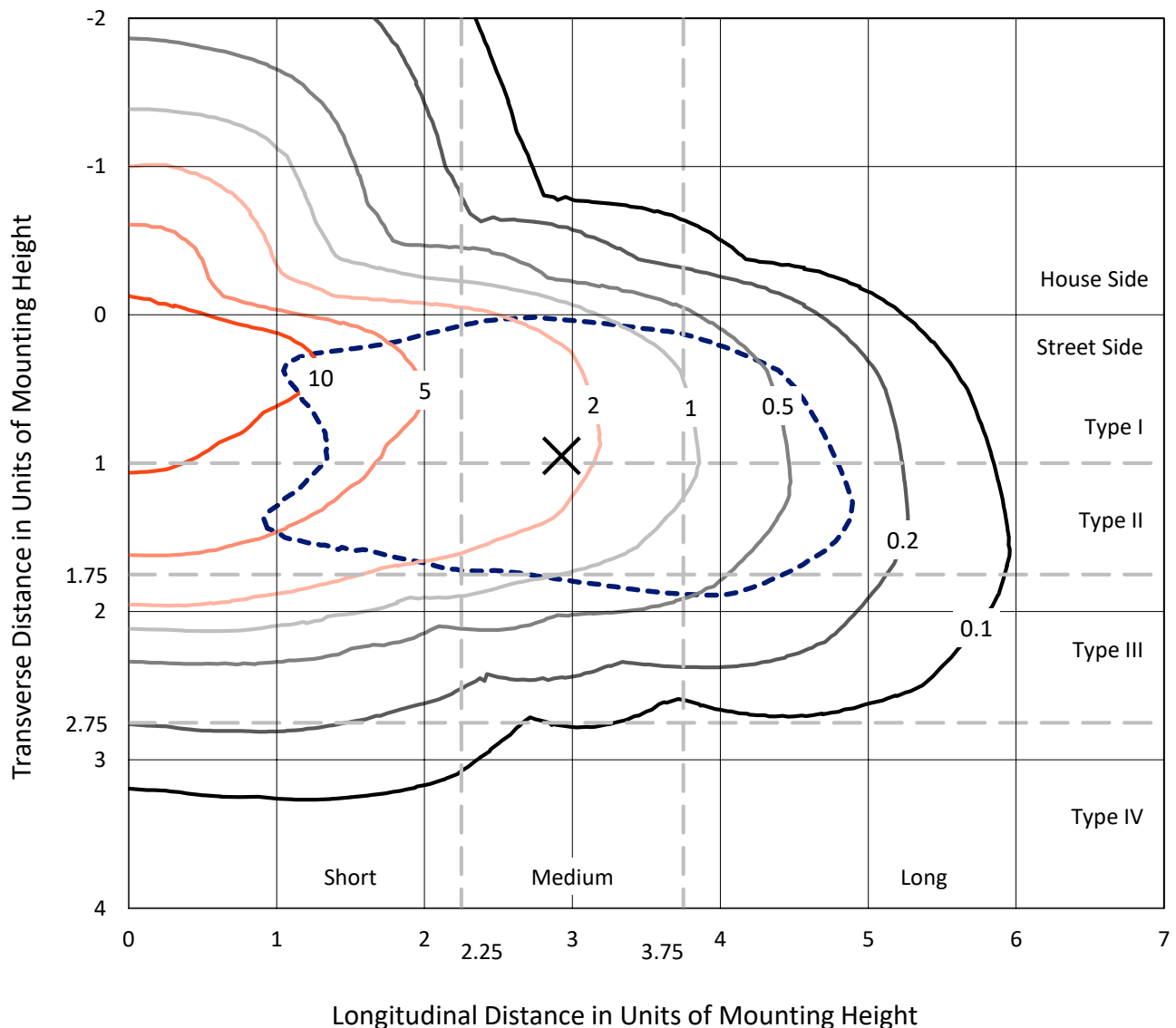
Input Watts (W): 511  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



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 CATALOG NUMBER: GLEON-SA8D-760-U-T2

## Iso-Footcandle Lines of Horizontal Illumination

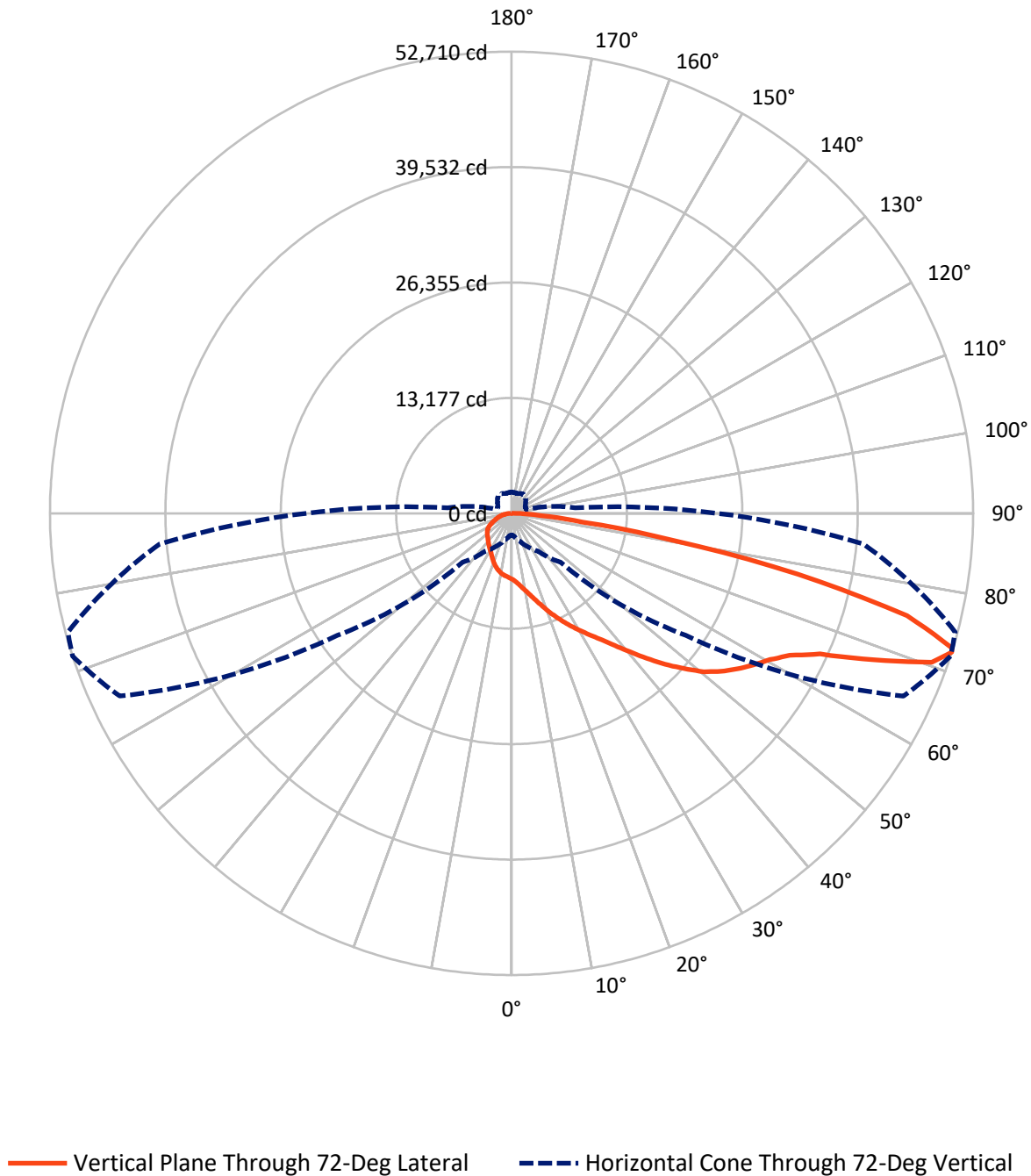
× Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 16.6 fc  
 Type III - Medium - N/A

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CATALOG NUMBER: GLEON-SA8D-760-U-T2

## Luminous Intensity Polar Plot



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CATALOG NUMBER: GLEON-SA8D-760-U-T2

**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 11320.2  | 0.0    | 11320.2 |
|                    | % Fixture | 18.6     | 0.0    | 18.6    |
| <b>Street Side</b> | Lumens    | 49702.8  | 0.0    | 49702.8 |
|                    | % Fixture | 81.4     | 0.0    | 81.4    |
| <b>Total</b>       | Lumens    | 61023.0  | 0.0    | 61023.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 752.3   | 1.2       |
| 10°-20°   | 2431.0  | 4.0       |
| 20°-30°   | 4259.8  | 7.0       |
| 30°-40°   | 6316.0  | 10.4      |
| 40°-50°   | 9237.6  | 15.1      |
| 50°-60°   | 12710.8 | 20.8      |
| 60°-70°   | 14151.0 | 23.2      |
| 70°-80°   | 9588.7  | 15.7      |
| 80°-90°   | 1576.0  | 2.6       |
| 90°-100°  | 0.0     | 0.0       |
| 100°-110° | 0.0     | 0.0       |
| 110°-120° | 0.0     | 0.0       |
| 120°-130° | 0.0     | 0.0       |
| 130°-140° | 0.0     | 0.0       |
| 140°-150° | 0.0     | 0.0       |
| 150°-160° | 0.0     | 0.0       |
| 160°-170° | 0.0     | 0.0       |
| 170°-180° | 0.0     | 0.0       |
| 0°-90°    | 61023.0 | 100.0     |
| 0°-180°   | 61023.0 | 100.0     |

**Coefficient of Utilization**



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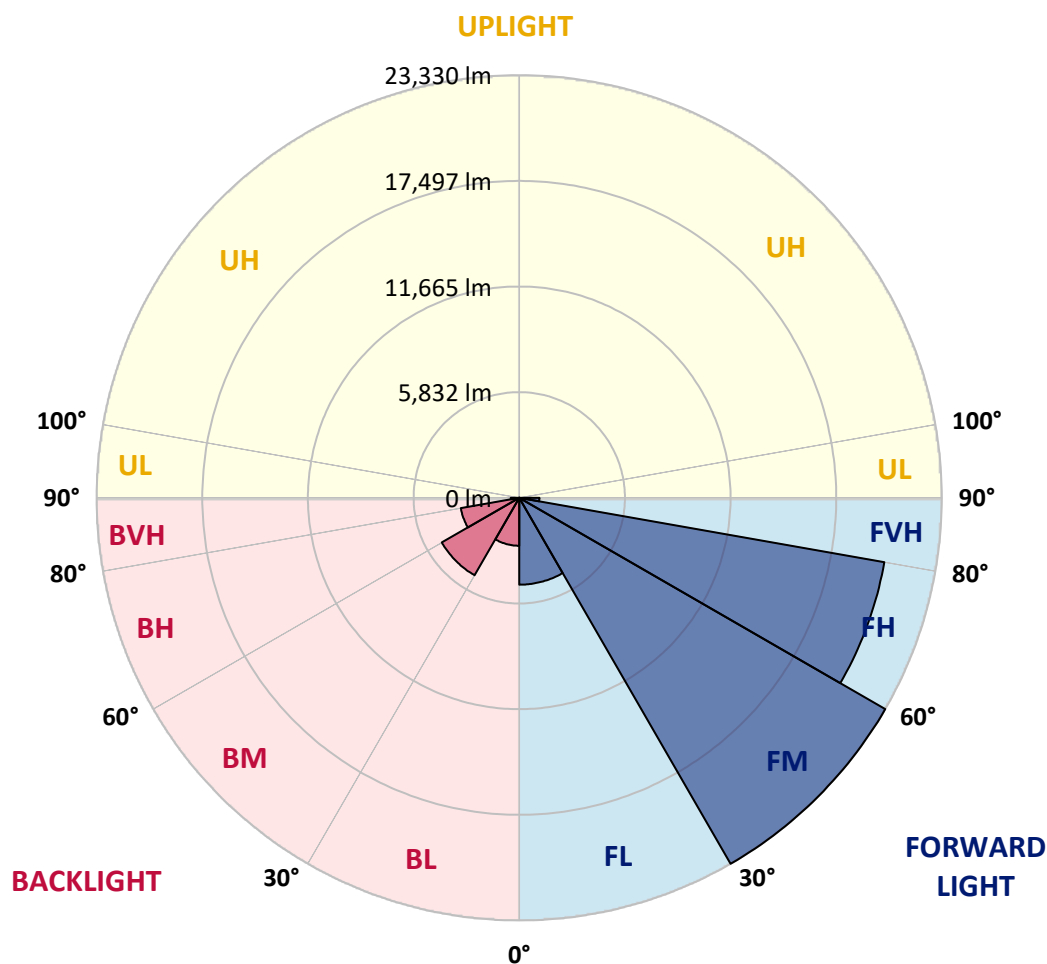
CATALOG NUMBER: GLEON-SA8D-760-U-T2

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

| Zone |             | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|---------|-----------|-------------------------|------|---------|
|      |             |         |           | B                       | U    | G       |
| FL   | (0°-30°)    | 4796.8  | 7.9       |                         |      |         |
| FM   | (30°-60°)   | 23329.8 | 38.2      |                         |      |         |
| FH   | (60°-80°)   | 20464.5 | 33.5      |                         |      | G5      |
| FVH  | (80°-90°)   | 1111.7  | 1.8       |                         |      | G5      |
| BL   | (0°-30°)    | 2646.2  | 4.3       | B4/5000                 |      |         |
| BM   | (30°-60°)   | 4934.5  | 8.1       | B3/5000                 |      |         |
| BH   | (60°-80°)   | 3275.1  | 5.4       | B4/5000                 |      | G4/5000 |
| BVH  | (80°-90°)   | 464.3   | 0.8       |                         |      | 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 III Medium



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CATALOG NUMBER: GLEON-SA8D-760-U-T2

**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 45°     | 55°     | 65°     | 72°     | 75°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 7507.4  | 7507.4  | 7507.4  | 7507.4  | 7507.4  | 7507.4  | 7507.4  | 7507.4  | 7507.4  | 7507.4  | 7507.4  |
| 2.5°  | 8293.3  | 8280.6  | 8236.5  | 8236.5  | 8152.5  | 8081.0  | 7946.6  | 7856.2  | 7749.1  | 7711.2  | 7585.2  |
| 5°    | 9095.9  | 9100.1  | 9045.5  | 9007.6  | 8883.7  | 8732.4  | 8503.4  | 8295.4  | 8087.3  | 8003.3  | 7744.9  |
| 7.5°  | 9770.4  | 9762.0  | 9747.3  | 9715.7  | 9600.2  | 9444.7  | 9135.8  | 8826.9  | 8520.2  | 8394.1  | 7948.7  |
| 10°   | 10203.2 | 10222.1 | 10234.7 | 10249.4 | 10201.1 | 10089.7 | 9797.7  | 9421.6  | 9020.3  | 8848.0  | 8192.4  |
| 12.5° | 10421.7 | 10455.3 | 10514.2 | 10615.0 | 10694.9 | 10682.3 | 10470.0 | 10070.8 | 9593.9  | 9377.4  | 8497.1  |
| 15°   | 10549.9 | 10594.0 | 10686.5 | 10867.2 | 11092.0 | 11220.2 | 11163.4 | 10802.0 | 10270.4 | 10003.6 | 8869.0  |
| 17.5° | 10629.7 | 10665.5 | 10808.3 | 11050.0 | 11384.0 | 11724.4 | 11873.6 | 11571.1 | 11035.3 | 10730.6 | 9295.5  |
| 20°   | 10684.4 | 10711.7 | 10890.3 | 11173.9 | 11606.8 | 12148.9 | 12564.9 | 12489.3 | 11877.8 | 11482.8 | 9740.9  |
| 22.5° | 10806.2 | 10829.3 | 10999.5 | 11285.3 | 11764.4 | 12464.0 | 13231.0 | 13344.4 | 12766.6 | 12319.1 | 10217.9 |
| 25°   | 11146.6 | 11146.6 | 11289.5 | 11489.1 | 11938.8 | 12737.2 | 13794.1 | 14296.2 | 13674.3 | 13153.2 | 10659.2 |
| 27.5° | 11795.9 | 11789.6 | 11842.1 | 11911.4 | 12251.8 | 13014.5 | 14296.2 | 15136.7 | 14615.6 | 14046.2 | 11087.8 |
| 30°   | 12564.9 | 12606.9 | 12613.2 | 12579.6 | 12739.3 | 13361.2 | 14760.6 | 16023.4 | 15563.2 | 14949.7 | 11526.9 |
| 32.5° | 13554.5 | 13581.9 | 13550.3 | 13439.0 | 13415.9 | 13852.9 | 15216.6 | 16952.1 | 16588.6 | 15893.1 | 11928.2 |
| 35°   | 14811.0 | 14758.5 | 14659.7 | 14432.8 | 14216.4 | 14510.6 | 15737.6 | 17880.8 | 17740.0 | 17034.1 | 12480.9 |
| 37.5° | 16157.9 | 16160.0 | 16038.1 | 15523.3 | 15225.0 | 15351.0 | 16456.2 | 18933.5 | 19133.1 | 18391.4 | 13188.9 |
| 40°   | 17237.9 | 17294.6 | 17370.2 | 16693.7 | 16307.1 | 16481.4 | 17370.2 | 20154.3 | 20780.4 | 20000.9 | 14111.3 |
| 42.5° | 17992.2 | 18057.3 | 18271.6 | 17847.2 | 17445.9 | 17769.5 | 18446.0 | 21457.0 | 22629.4 | 21858.3 | 15191.3 |
| 45°   | 18790.6 | 18826.3 | 18977.6 | 18794.8 | 18538.5 | 19267.6 | 19658.4 | 22805.9 | 24585.6 | 23837.6 | 16399.5 |
| 47.5° | 19631.1 | 19668.9 | 19824.4 | 19702.5 | 19568.0 | 20666.9 | 20923.3 | 24077.1 | 26459.8 | 26012.3 | 17689.6 |
| 50°   | 20669.0 | 20694.3 | 20841.3 | 20620.7 | 20662.7 | 21721.7 | 22053.7 | 25243.3 | 28424.4 | 27966.4 | 18983.9 |
| 52.5° | 22085.2 | 22091.5 | 22295.3 | 22095.7 | 21898.2 | 22494.9 | 23026.5 | 26342.2 | 29964.5 | 29748.1 | 20278.2 |
| 55°   | 23194.6 | 23261.9 | 23930.0 | 23888.0 | 23774.6 | 23196.7 | 23839.7 | 27388.5 | 31338.7 | 31441.7 | 21652.4 |
| 57.5° | 22486.5 | 22749.2 | 24102.3 | 25056.3 | 25985.0 | 24942.8 | 24938.6 | 28567.3 | 32616.2 | 33103.7 | 23163.1 |
| 60°   | 19694.1 | 20051.3 | 22045.3 | 24161.2 | 27067.1 | 27981.1 | 27220.4 | 30006.6 | 33906.3 | 34751.0 | 25056.3 |
| 62.5° | 14065.1 | 14653.4 | 17355.5 | 20734.2 | 25583.6 | 29994.0 | 31864.0 | 32290.5 | 35660.8 | 36658.8 | 27516.7 |
| 65°   | 7110.3  | 7555.7  | 9820.8  | 13890.7 | 20440.0 | 28678.6 | 36911.0 | 37291.3 | 38709.5 | 39596.2 | 31305.1 |
| 67.5° | 4320.0  | 4488.1  | 5593.3  | 7725.9  | 12531.3 | 22339.5 | 38558.3 | 45626.5 | 44609.6 | 45080.2 | 36707.1 |
| 70°   | 3183.2  | 3307.2  | 3996.4  | 5131.0  | 7207.0  | 13109.1 | 33502.9 | 51574.9 | 50906.7 | 50854.2 | 40699.3 |
| 72°   | 2479.4  | 2569.7  | 3179.0  | 4145.6  | 5269.7  | 7864.6  | 24283.0 | 49379.2 | 52709.5 | 52444.8 | 40333.7 |
| 72.5° | 2351.2  | 2431.0  | 2985.7  | 3901.8  | 4979.7  | 7129.2  | 21833.1 | 47897.9 | 52579.3 | 52459.5 | 39861.0 |
| 75°   | 1851.1  | 1907.8  | 2210.4  | 3017.3  | 3897.6  | 4044.7  | 11964.0 | 37119.0 | 46643.5 | 48582.9 | 35852.0 |
| 77.5° | 1531.7  | 1540.1  | 1699.8  | 2195.7  | 3038.3  | 2859.7  | 5876.9  | 25753.8 | 33399.9 | 35532.6 | 25396.6 |
| 80°   | 1248.1  | 1258.6  | 1334.2  | 1540.1  | 2298.7  | 2115.9  | 2790.3  | 14808.9 | 18700.3 | 18723.4 | 12077.4 |
| 82.5° | 993.8   | 995.9   | 1080.0  | 1126.2  | 1651.5  | 1512.8  | 1599.0  | 6952.7  | 8171.4  | 7860.4  | 4341.0  |
| 85°   | 699.7   | 685.0   | 1054.8  | 924.5   | 1080.0  | 970.7   | 882.5   | 2752.5  | 3378.7  | 3231.6  | 1359.4  |
| 87.5° | 233.2   | 241.6   | 468.6   | 598.8   | 630.3   | 550.5   | 392.9   | 1054.8  | 1275.4  | 1264.9  | 430.7   |
| 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: P318182

CATALOG NUMBER: GLEON-SA8D-760-U-T2

**CANDELA DISTRIBUTION (continued):**

|       | 90°     | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 7507.4  | 7507.4 | 7507.4 | 7507.4 | 7507.4 | 7507.4 | 7507.4 | 7507.4 | 7507.4 | 7507.4 | 7507.4 |
| 2.5°  | 7545.2  | 7478.0 | 7379.3 | 7270.0 | 7183.8 | 7095.6 | 7030.5 | 6996.8 | 6959.0 | 6927.5 | 6965.3 |
| 5°    | 7625.1  | 7499.0 | 7288.9 | 7083.0 | 6931.7 | 6797.2 | 6700.6 | 6650.2 | 6603.9 | 6572.4 | 6576.6 |
| 7.5°  | 7755.4  | 7551.5 | 7198.6 | 6898.1 | 6688.0 | 6543.0 | 6444.2 | 6410.6 | 6381.2 | 6372.8 | 6383.3 |
| 10°   | 7894.0  | 7593.6 | 7078.8 | 6679.6 | 6440.0 | 6320.3 | 6276.1 | 6299.3 | 6320.3 | 6339.2 | 6360.2 |
| 12.5° | 8051.6  | 7631.4 | 6904.4 | 6423.2 | 6219.4 | 6173.2 | 6217.3 | 6318.2 | 6391.7 | 6435.8 | 6463.1 |
| 15°   | 8257.5  | 7665.0 | 6702.7 | 6166.9 | 6030.3 | 6082.8 | 6232.0 | 6406.4 | 6534.6 | 6616.5 | 6629.1 |
| 17.5° | 8446.6  | 7662.9 | 6444.2 | 5908.4 | 5876.9 | 6030.3 | 6255.1 | 6501.0 | 6673.3 | 6788.8 | 6811.9 |
| 20°   | 8642.0  | 7606.2 | 6143.8 | 5656.3 | 5721.4 | 5973.6 | 6265.6 | 6561.9 | 6769.9 | 6904.4 | 6935.9 |
| 22.5° | 8824.8  | 7507.4 | 5813.9 | 5427.3 | 5591.2 | 5897.9 | 6225.7 | 6526.2 | 6734.2 | 6843.5 | 6877.1 |
| 25°   | 8948.8  | 7335.1 | 5479.8 | 5234.0 | 5475.6 | 5805.5 | 6095.4 | 6337.1 | 6492.6 | 6547.2 | 6555.6 |
| 27.5° | 9011.8  | 7110.3 | 5164.6 | 5065.9 | 5355.8 | 5654.2 | 5853.8 | 5973.6 | 6017.7 | 6013.5 | 6005.1 |
| 30°   | 9020.3  | 6814.0 | 4893.6 | 4929.3 | 5217.2 | 5431.5 | 5526.0 | 5502.9 | 5446.2 | 5349.5 | 5357.9 |
| 32.5° | 8992.9  | 6480.0 | 4666.7 | 4799.0 | 5040.7 | 5160.4 | 5164.6 | 5053.3 | 4902.0 | 4748.6 | 4706.6 |
| 35°   | 9001.3  | 6152.2 | 4467.1 | 4652.0 | 4826.3 | 4878.9 | 4830.6 | 4666.7 | 4460.7 | 4263.2 | 4221.2 |
| 37.5° | 9093.8  | 5866.4 | 4294.8 | 4481.8 | 4588.9 | 4601.5 | 4532.2 | 4359.9 | 4208.6 | 4015.3 | 3998.5 |
| 40°   | 9314.4  | 5662.6 | 4130.9 | 4290.6 | 4351.5 | 4357.8 | 4259.0 | 4137.2 | 4149.8 | 4046.8 | 4044.7 |
| 42.5° | 9711.5  | 5574.4 | 3985.9 | 4090.9 | 4128.8 | 4141.4 | 4065.7 | 3988.0 | 4097.2 | 4030.0 | 4006.9 |
| 45°   | 10224.2 | 5595.4 | 3864.0 | 3895.5 | 3964.9 | 4023.7 | 3977.5 | 3882.9 | 3925.0 | 3632.9 | 3536.2 |
| 47.5° | 10816.7 | 5729.8 | 3767.4 | 3727.4 | 3847.2 | 3958.6 | 3887.1 | 3744.3 | 3595.1 | 3305.1 | 3250.5 |
| 50°   | 11510.1 | 5937.9 | 3679.1 | 3561.5 | 3719.0 | 3870.3 | 3798.9 | 3595.1 | 3370.3 | 3229.5 | 3210.6 |
| 52.5° | 12232.9 | 6192.1 | 3590.9 | 3378.7 | 3557.3 | 3803.1 | 3767.4 | 3561.5 | 3284.1 | 3145.4 | 3120.2 |
| 55°   | 13052.4 | 6448.4 | 3479.5 | 3166.4 | 3382.9 | 3771.6 | 3752.7 | 3439.6 | 3219.0 | 3141.2 | 3122.3 |
| 57.5° | 14071.4 | 6740.5 | 3332.4 | 2945.8 | 3219.0 | 3658.1 | 3599.3 | 3366.0 | 3151.7 | 3092.9 | 3086.6 |
| 60°   | 15399.4 | 7171.2 | 3120.2 | 2710.5 | 3019.4 | 3483.7 | 3471.1 | 3258.9 | 3044.6 | 3002.5 | 2994.1 |
| 62.5° | 17391.2 | 7883.5 | 2828.2 | 2475.2 | 2796.6 | 3187.4 | 3303.0 | 3113.9 | 2931.1 | 2929.0 | 2933.2 |
| 65°   | 20479.9 | 8955.1 | 2510.9 | 2269.2 | 2571.8 | 2937.4 | 3107.6 | 2964.7 | 2815.5 | 2857.6 | 2863.9 |
| 67.5° | 24060.3 | 9843.9 | 2199.9 | 2067.5 | 2342.8 | 2700.0 | 2931.1 | 2815.5 | 2662.2 | 2771.4 | 2773.5 |
| 70°   | 25251.7 | 9049.7 | 1926.8 | 1867.9 | 2105.4 | 2471.0 | 2739.9 | 2651.7 | 2496.2 | 2605.4 | 2594.9 |
| 72°   | 23499.3 | 7305.7 | 1750.3 | 1716.6 | 1926.8 | 2281.9 | 2569.7 | 2498.3 | 2344.9 | 2418.4 | 2391.1 |
| 72.5° | 22946.7 | 6965.3 | 1706.1 | 1678.8 | 1878.4 | 2233.5 | 2525.6 | 2460.5 | 2307.1 | 2370.1 | 2344.9 |
| 75°   | 20469.4 | 6049.2 | 1466.6 | 1472.9 | 1638.9 | 1998.2 | 2277.7 | 2256.6 | 2099.1 | 2105.4 | 2097.0 |
| 77.5° | 14846.7 | 4435.5 | 1235.5 | 1277.5 | 1395.2 | 1756.6 | 2027.6 | 2015.0 | 1842.7 | 1811.2 | 1804.9 |
| 80°   | 6889.7  | 2262.9 | 1006.5 | 1025.4 | 1147.2 | 1468.7 | 1729.2 | 1712.4 | 1573.8 | 1533.8 | 1510.7 |
| 82.5° | 2359.6  | 1075.8 | 756.4  | 769.0  | 888.8  | 1182.9 | 1500.2 | 1489.7 | 1374.2 | 1296.4 | 1248.1 |
| 85°   | 842.6   | 535.8  | 529.5  | 516.9  | 634.5  | 930.8  | 1306.9 | 1250.2 | 1080.0 | 920.3  | 916.1  |
| 87.5° | 273.1   | 229.0  | 273.1  | 271.0  | 369.8  | 630.3  | 949.7  | 808.9  | 783.7  | 651.4  | 638.8  |
| 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

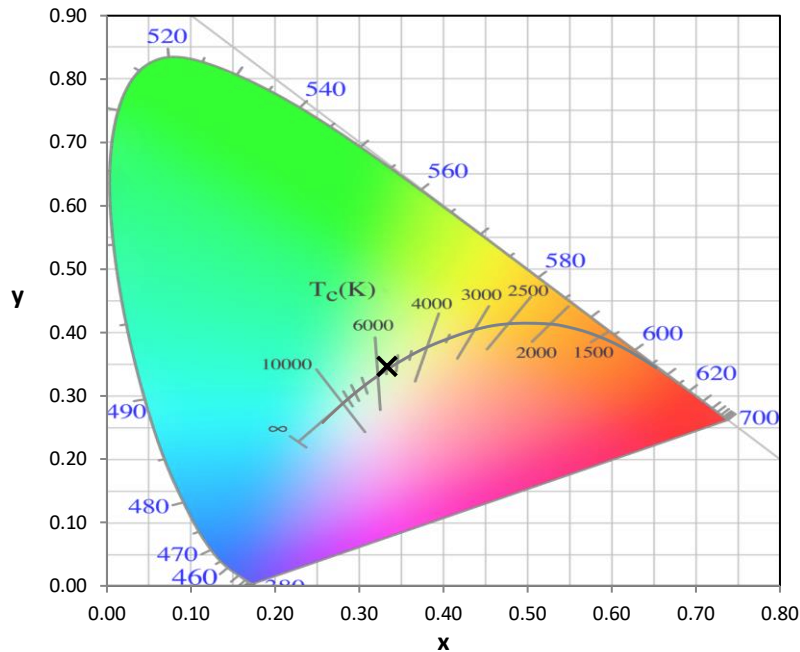
Stabilization Time: 240M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 24.6/31%  
 Sphere Temperature (°C): 25.9

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**



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| 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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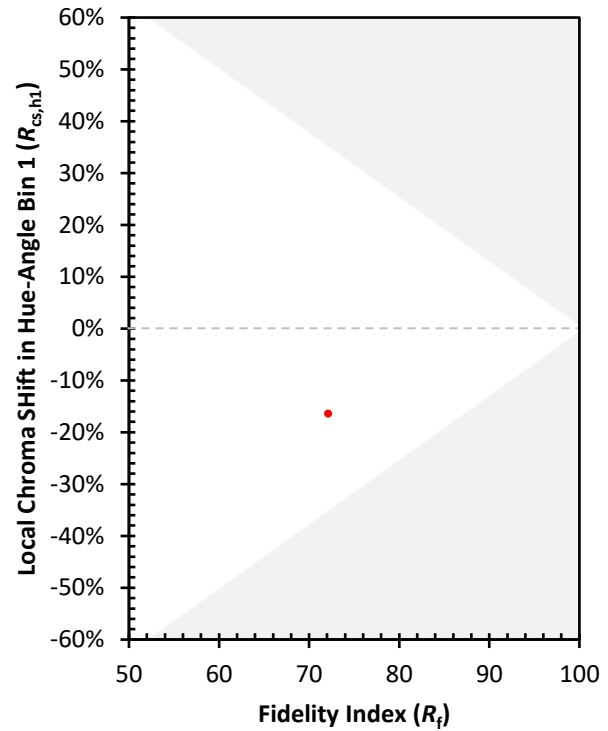
Color Rendition by Hue-Angle Bin



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**Measure Comparisons**



(END OF REPORT)