

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: P321854

Luminaire Tested: **GLEON-SA0C-727-U-T2-HSS**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P321854  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-13)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA0C-727-U-T2-HSS  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(10) 70 CRI, 2700K, 1050mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE II OPTICS WITH HOUSE SIDE SHIELD  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 41651 lumens  
Efficiency: N/A  
Efficacy: 74.6 lumens/watt  
Luminous Opening: Rectangular (W 2.5' x L: 1' x H: 0')  
IES Classification: Type II - Medium  
BUG Rating: B2 - U0 - G5

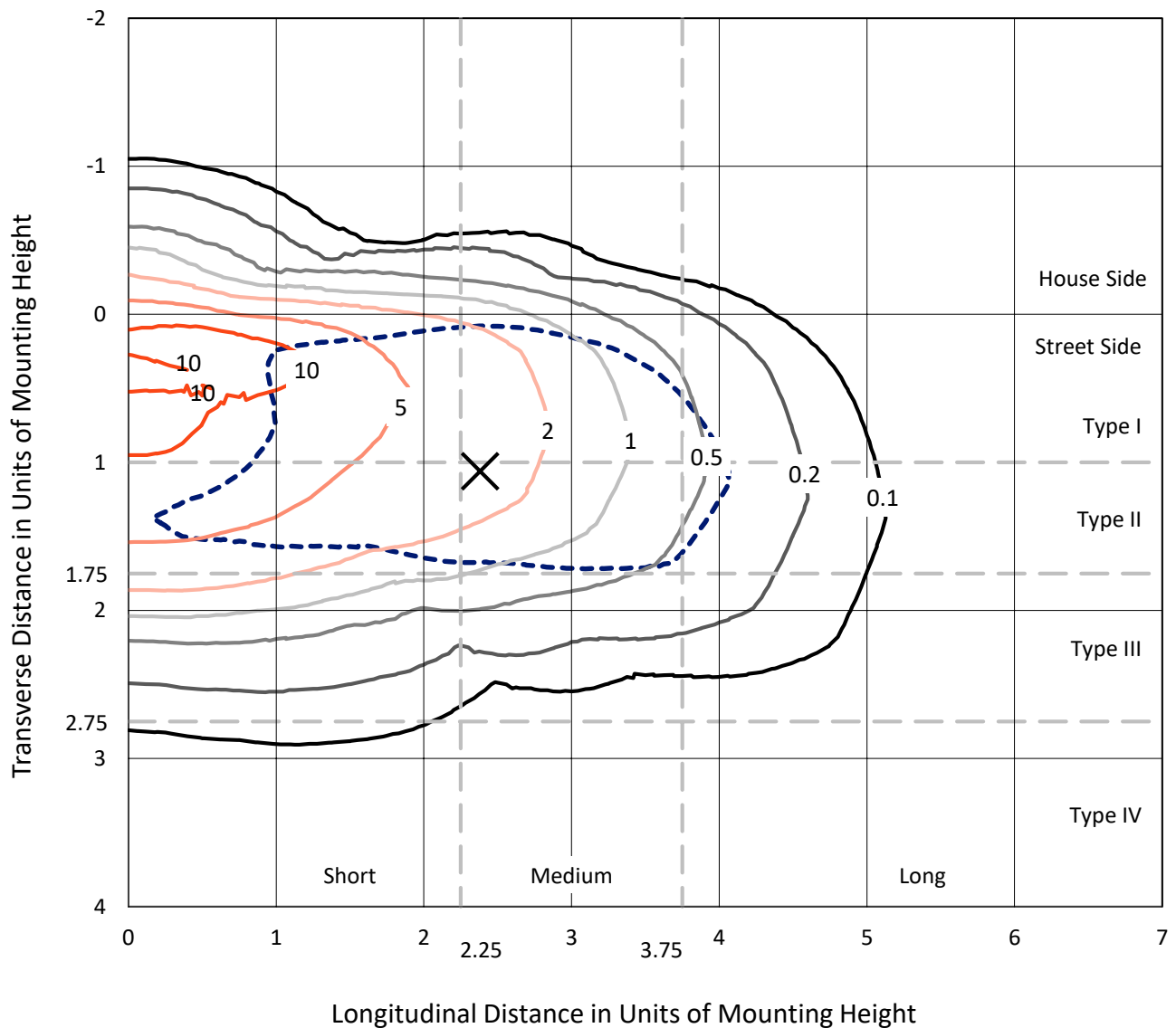
Input Watts (W): 558  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



REPORT NUMBER: P321854  
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### Iso-Footcandle Lines of Horizontal Illumination

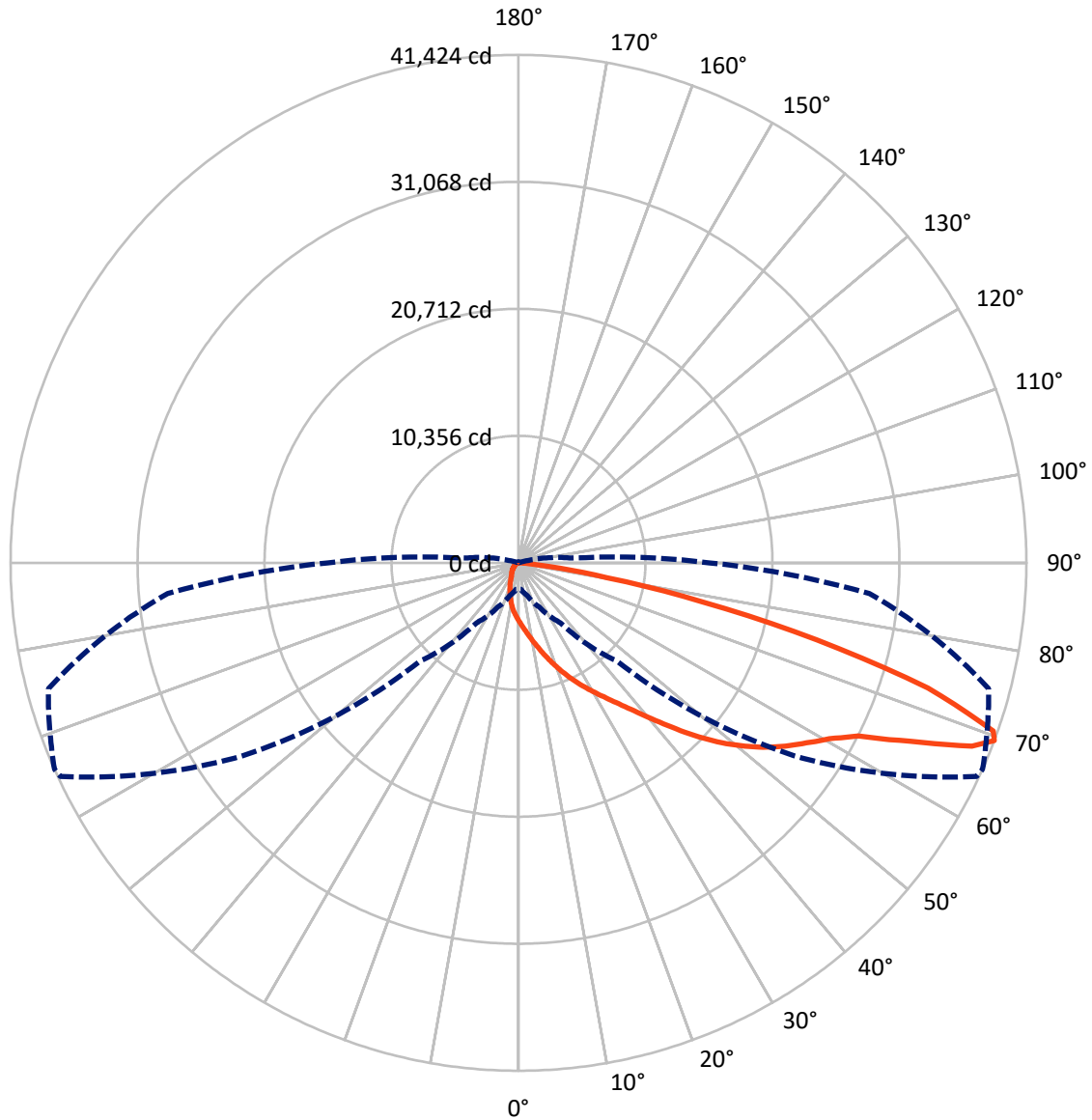
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 12.5 fc  
 Type II - Medium - N/A

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### Luminous Intensity Polar Plot



— Vertical Plane Through 66-Deg Lateral      - - - Horizontal Cone Through 69-Deg Vertical

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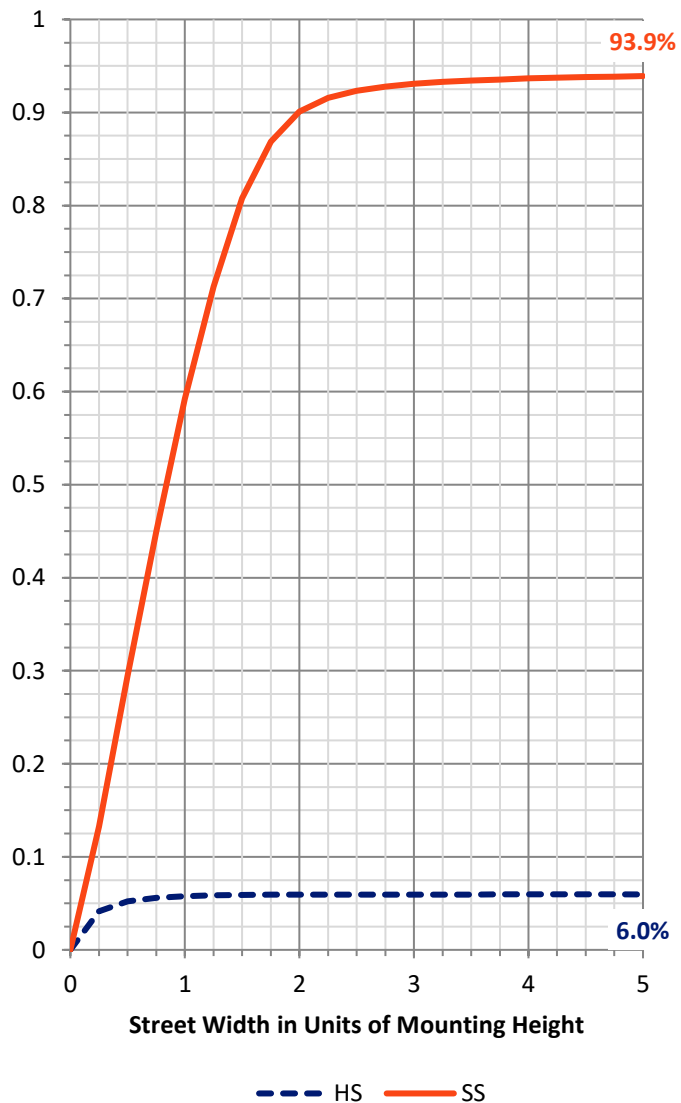
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 2498.5   | 0.0    | 2498.5  |
|                    | % Fixture | 6.0      | 0.0    | 6.0     |
| <b>Street Side</b> | Lumens    | 39152.5  | 0.0    | 39152.5 |
|                    | % Fixture | 94.0     | 0.0    | 94.0    |
| <b>Total</b>       | Lumens    | 41651.0  | 0.0    | 41651.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 458.2   | 1.1       |
| 10°-20°   | 1363.6  | 3.3       |
| 20°-30°   | 2374.6  | 5.7       |
| 30°-40°   | 4166.2  | 10.0      |
| 40°-50°   | 6973.6  | 16.7      |
| 50°-60°   | 10250.6 | 24.6      |
| 60°-70°   | 10524.8 | 25.3      |
| 70°-80°   | 5195.8  | 12.5      |
| 80°-90°   | 343.6   | 0.8       |
| 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°    | 41651.0 | 100.0     |
| 0°-180°   | 41651.0 | 100.0     |

**Coefficient of Utilization**

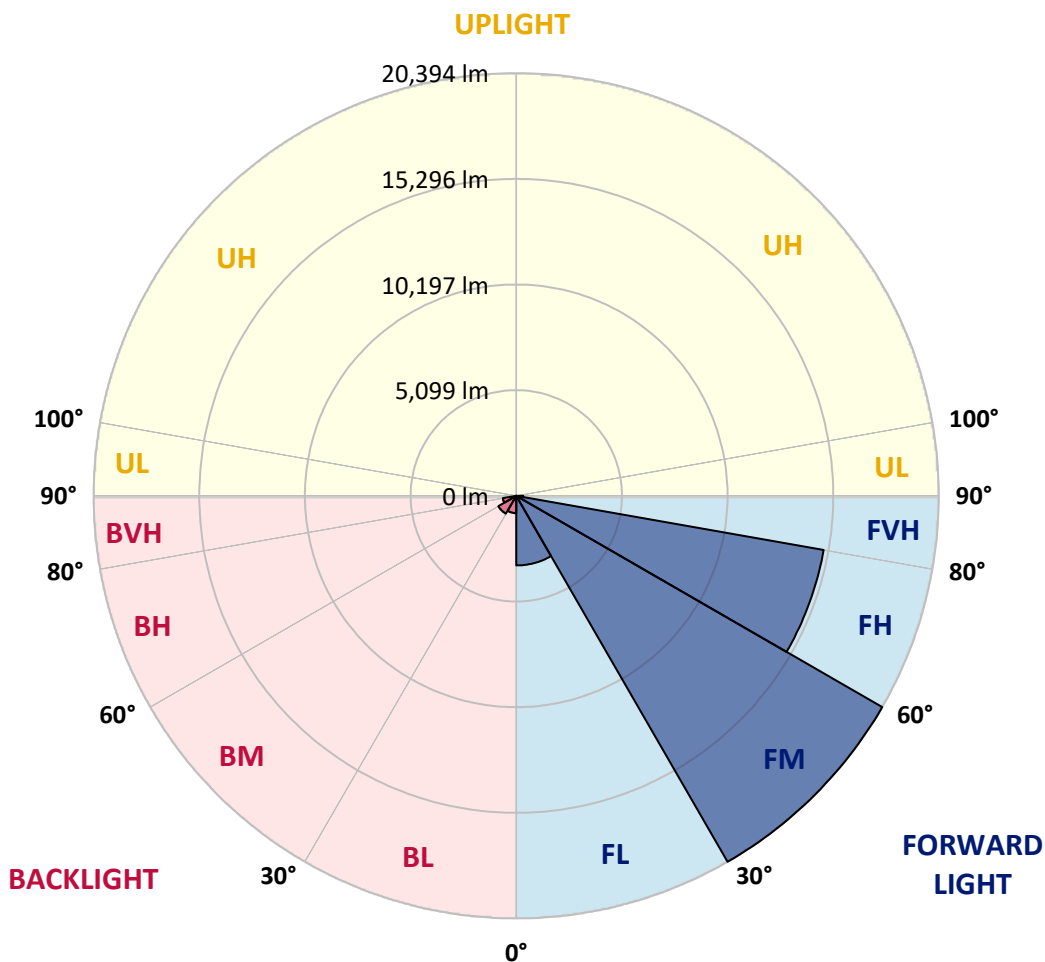


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**LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:**

| Zone           | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |         |
|----------------|---------|-----------|-------------------------|------|---------|
|                |         |           | B                       | U    | G       |
| FL (0°-30°)    | 3360.8  | 8.1       |                         |      |         |
| FM (30°-60°)   | 20394.3 | 49.0      |                         |      |         |
| FH (60°-80°)   | 15062.1 | 36.2      |                         |      | G5      |
| FVH (80°-90°)  | 335.2   | 0.8       |                         |      | G3/500  |
| BL (0°-30°)    | 835.6   | 2.0       | B2/1000                 |      |         |
| BM (30°-60°)   | 996.2   | 2.4       | B1/1000                 |      |         |
| BH (60°-80°)   | 658.4   | 1.6       | B2/1000                 |      | G2/1000 |
| BVH (80°-90°)  | 8.3     | 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-G5**  
 Type II Medium





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 45°     | 55°     | 65°     | 66°     | 75°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 4740.0  | 4740.0  | 4740.0  | 4740.0  | 4740.0  | 4740.0  | 4740.0  | 4740.0  | 4740.0  | 4740.0  | 4740.0  |
| 2.5°  | 5578.8  | 5555.1  | 5545.2  | 5501.7  | 5426.5  | 5369.1  | 5258.3  | 5129.7  | 5106.0  | 4981.4  | 4829.0  |
| 5°    | 6302.9  | 6283.1  | 6269.2  | 6207.9  | 6130.8  | 5986.3  | 5784.6  | 5545.2  | 5499.7  | 5262.3  | 4957.6  |
| 7.5°  | 6807.3  | 6843.0  | 6843.0  | 6803.4  | 6706.5  | 6597.6  | 6350.4  | 6023.9  | 5966.6  | 5602.6  | 5129.7  |
| 10°   | 7102.1  | 7145.6  | 7179.3  | 7212.9  | 7199.0  | 7155.5  | 6922.1  | 6554.1  | 6484.9  | 6002.2  | 5329.6  |
| 12.5° | 7129.8  | 7173.3  | 7268.3  | 7408.8  | 7545.3  | 7644.2  | 7497.8  | 7141.7  | 7062.5  | 6465.1  | 5566.9  |
| 15°   | 6975.5  | 7021.0  | 7167.4  | 7440.4  | 7770.8  | 8059.6  | 8107.1  | 7792.5  | 7711.4  | 7017.0  | 5863.7  |
| 17.5° | 6706.5  | 6736.1  | 6945.8  | 7323.7  | 7842.0  | 8372.2  | 8659.0  | 8490.9  | 8415.7  | 7648.1  | 6194.1  |
| 20°   | 6506.6  | 6528.4  | 6712.4  | 7117.9  | 7798.5  | 8568.0  | 9181.3  | 9232.7  | 9153.6  | 8324.7  | 6552.1  |
| 22.5° | 6848.9  | 6888.5  | 6894.4  | 7086.3  | 7679.8  | 8665.0  | 9640.3  | 9962.7  | 9903.4  | 9042.8  | 6904.3  |
| 25°   | 7784.6  | 7830.1  | 7679.8  | 7561.1  | 7780.7  | 8708.5  | 10034.0 | 10710.5 | 10663.1 | 9816.3  | 7258.4  |
| 27.5° | 9021.1  | 9068.5  | 8874.7  | 8520.6  | 8308.9  | 8872.7  | 10384.1 | 11470.2 | 11468.2 | 10635.4 | 7640.2  |
| 30°   | 10235.7 | 10283.2 | 10085.4 | 9731.3  | 9244.6  | 9337.6  | 10686.8 | 12265.5 | 12277.4 | 11480.1 | 8045.8  |
| 32.5° | 11509.8 | 11569.1 | 11365.4 | 10910.3 | 10401.9 | 10140.8 | 11112.1 | 13064.7 | 13132.0 | 12459.4 | 8502.8  |
| 35°   | 12957.9 | 12965.8 | 12679.0 | 12202.2 | 11616.6 | 11215.0 | 11794.7 | 13960.9 | 14121.1 | 13672.1 | 9082.4  |
| 37.5° | 14378.3 | 14435.7 | 14200.3 | 13448.5 | 12910.4 | 12455.4 | 12809.5 | 15080.6 | 15308.1 | 15153.8 | 9840.1  |
| 40°   | 15430.8 | 15551.5 | 15517.8 | 14706.7 | 14196.3 | 13871.9 | 14069.7 | 16412.0 | 16700.8 | 16878.9 | 10795.6 |
| 42.5° | 16091.5 | 16182.5 | 16336.8 | 15848.2 | 15385.3 | 15438.7 | 15557.4 | 17963.0 | 18319.1 | 18845.3 | 11893.6 |
| 45°   | 16849.2 | 16892.7 | 17021.3 | 16805.7 | 16493.1 | 17031.2 | 17136.1 | 19709.8 | 20083.7 | 20960.1 | 13112.2 |
| 47.5° | 17775.1 | 17877.9 | 17913.5 | 17715.7 | 17573.3 | 18439.8 | 18657.4 | 21298.4 | 21822.7 | 23225.3 | 14402.1 |
| 50°   | 18954.1 | 18981.8 | 19043.2 | 18914.6 | 18772.1 | 19650.5 | 20022.4 | 22966.1 | 23442.9 | 25498.4 | 15674.1 |
| 52.5° | 20107.5 | 20206.4 | 20420.1 | 20338.9 | 20281.6 | 20681.2 | 21239.1 | 24469.6 | 25001.8 | 27393.6 | 16944.2 |
| 55°   | 20439.8 | 20524.9 | 21262.8 | 21767.3 | 22234.2 | 21951.3 | 22402.3 | 25816.9 | 26392.6 | 29087.0 | 18166.8 |
| 57.5° | 19112.4 | 19284.5 | 20562.5 | 21876.1 | 23812.9 | 23925.6 | 24000.8 | 27199.7 | 27716.0 | 30384.8 | 19438.8 |
| 60°   | 15757.2 | 15790.8 | 17887.8 | 20141.1 | 23551.7 | 25648.7 | 26335.2 | 28685.4 | 29118.7 | 31593.5 | 20962.1 |
| 62.5° | 10022.1 | 10364.3 | 12665.1 | 15846.2 | 20790.0 | 25399.5 | 29158.2 | 30932.8 | 31091.0 | 33043.6 | 23146.2 |
| 65°   | 4773.6  | 4995.2  | 6653.0  | 9790.6  | 15058.9 | 22208.4 | 31106.9 | 34998.2 | 35069.4 | 35918.1 | 26064.2 |
| 67.5° | 2643.0  | 2749.8  | 3539.2  | 5270.2  | 8803.5  | 15705.8 | 30319.5 | 39813.4 | 39880.6 | 38853.9 | 28624.1 |
| 69°   | 2067.3  | 2158.3  | 2779.5  | 3972.4  | 5968.5  | 11288.2 | 27437.1 | 41223.9 | 41423.7 | 39694.7 | 28715.1 |
| 70°   | 1754.8  | 1843.8  | 2393.7  | 3355.2  | 4799.4  | 8722.3  | 24422.2 | 40873.7 | 41085.4 | 39615.5 | 28036.5 |
| 72.5° | 1074.2  | 1125.7  | 1594.5  | 2362.1  | 3216.7  | 4387.9  | 15060.8 | 34566.9 | 34925.0 | 36339.5 | 24095.7 |
| 75°   | 724.1   | 751.8   | 997.1   | 1630.1  | 2300.8  | 2259.2  | 7824.2  | 24364.8 | 25140.3 | 28268.0 | 17796.8 |
| 77.5° | 518.3   | 544.0   | 668.7   | 1054.4  | 1612.3  | 1491.6  | 3543.1  | 15141.9 | 15308.1 | 16954.1 | 9705.6  |
| 80°   | 294.8   | 318.5   | 472.8   | 627.1   | 1094.0  | 995.1   | 1408.6  | 7232.7  | 7315.8  | 7270.3  | 3240.5  |
| 82.5° | 154.3   | 174.1   | 259.2   | 413.5   | 702.3   | 650.9   | 585.6   | 2421.4  | 2433.3  | 2023.8  | 710.2   |
| 85°   | 29.7    | 35.6    | 128.6   | 282.9   | 362.0   | 282.9   | 239.4   | 567.8   | 579.6   | 512.4   | 176.1   |
| 87.5° | 0.0     | 2.0     | 51.4    | 63.3    | 71.2    | 73.2    | 77.2    | 110.8   | 118.7   | 160.2   | 47.5    |
| 90°   | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |



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CATALOG NUMBER: GLEON-SA0C-727-U-T2-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°     | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 4740.0  | 4740.0 | 4740.0 | 4740.0 | 4740.0 | 4740.0 | 4740.0 | 4740.0 | 4740.0 | 4740.0 | 4740.0 |
| 2.5°  | 4761.8  | 4690.6 | 4554.1 | 4395.8 | 4273.1 | 4152.5 | 4057.5 | 3958.6 | 3923.0 | 3905.2 | 3903.2 |
| 5°    | 4809.3  | 4658.9 | 4370.1 | 4073.3 | 3830.0 | 3600.5 | 3436.3 | 3280.0 | 3206.8 | 3173.2 | 3159.4 |
| 7.5°  | 4888.4  | 4647.0 | 4182.1 | 3729.1 | 3378.9 | 3092.1 | 2864.6 | 2694.5 | 2609.4 | 2573.8 | 2559.9 |
| 10°   | 4981.4  | 4631.2 | 3962.5 | 3365.1 | 2918.0 | 2621.3 | 2395.7 | 2227.6 | 2134.6 | 2095.0 | 2075.2 |
| 12.5° | 5090.2  | 4603.5 | 3709.3 | 2997.1 | 2524.3 | 2227.6 | 1954.6 | 1746.8 | 1640.0 | 1594.5 | 1572.8 |
| 15°   | 5224.7  | 4575.8 | 3444.2 | 2650.9 | 2178.1 | 1816.1 | 1517.4 | 1376.9 | 1355.1 | 1347.2 | 1349.2 |
| 17.5° | 5357.2  | 4532.3 | 3155.4 | 2308.7 | 1814.1 | 1418.4 | 1266.1 | 1258.2 | 1262.2 | 1262.2 | 1262.2 |
| 20°   | 5475.9  | 4433.4 | 2840.8 | 2015.9 | 1467.9 | 1196.9 | 1165.2 | 1151.4 | 1141.5 | 1133.6 | 1123.7 |
| 22.5° | 5568.9  | 4300.8 | 2538.2 | 1725.1 | 1198.9 | 1096.0 | 1046.5 | 1003.0 | 967.4  | 943.7  | 931.8  |
| 25°   | 5632.2  | 4124.8 | 2261.2 | 1446.1 | 1078.2 | 997.1  | 908.0  | 834.8  | 779.5  | 745.8  | 732.0  |
| 27.5° | 5679.7  | 3934.8 | 2013.9 | 1210.7 | 995.1  | 882.3  | 765.6  | 678.6  | 621.2  | 591.5  | 579.6  |
| 30°   | 5713.3  | 3719.2 | 1796.3 | 1064.3 | 902.1  | 761.6  | 637.0  | 551.9  | 510.4  | 494.6  | 486.7  |
| 32.5° | 5745.0  | 3479.8 | 1590.6 | 995.1  | 815.1  | 650.9  | 534.1  | 468.9  | 443.1  | 423.4  | 417.4  |
| 35°   | 5824.1  | 3258.3 | 1394.7 | 921.9  | 726.0  | 555.9  | 459.0  | 411.5  | 385.8  | 373.9  | 369.9  |
| 37.5° | 6012.1  | 3094.1 | 1206.8 | 846.7  | 637.0  | 480.7  | 401.6  | 368.0  | 344.2  | 332.4  | 328.4  |
| 40°   | 6314.7  | 3011.0 | 1048.5 | 765.6  | 550.0  | 423.4  | 364.0  | 332.4  | 306.6  | 288.8  | 284.9  |
| 42.5° | 6759.9  | 3022.8 | 937.7  | 684.5  | 480.7  | 377.9  | 328.4  | 290.8  | 263.1  | 247.3  | 243.3  |
| 45°   | 7299.9  | 3109.9 | 860.6  | 605.4  | 423.4  | 342.2  | 288.8  | 249.3  | 223.5  | 209.7  | 205.7  |
| 47.5° | 7885.5  | 3250.4 | 797.3  | 534.1  | 377.9  | 308.6  | 249.3  | 207.7  | 186.0  | 174.1  | 172.1  |
| 50°   | 8502.8  | 3386.9 | 732.0  | 464.9  | 338.3  | 275.0  | 209.7  | 172.1  | 154.3  | 144.4  | 140.5  |
| 52.5° | 9127.9  | 3545.1 | 672.6  | 401.6  | 304.7  | 235.4  | 174.1  | 140.5  | 126.6  | 118.7  | 114.7  |
| 55°   | 9800.5  | 3663.8 | 615.3  | 352.1  | 271.0  | 199.8  | 144.4  | 116.7  | 104.9  | 95.0   | 93.0   |
| 57.5° | 10591.8 | 3847.8 | 555.9  | 304.7  | 231.5  | 166.2  | 118.7  | 93.0   | 83.1   | 73.2   | 71.2   |
| 60°   | 11660.1 | 4063.4 | 492.6  | 269.0  | 189.9  | 136.5  | 96.9   | 75.2   | 63.3   | 55.4   | 53.4   |
| 62.5° | 13068.7 | 4302.8 | 413.5  | 235.4  | 154.3  | 110.8  | 77.2   | 59.3   | 45.5   | 35.6   | 35.6   |
| 65°   | 14855.1 | 4692.5 | 338.3  | 197.8  | 126.6  | 91.0   | 59.3   | 43.5   | 25.7   | 15.8   | 15.8   |
| 67.5° | 15897.7 | 4759.8 | 273.0  | 162.2  | 102.9  | 77.2   | 49.5   | 29.7   | 7.9    | 2.0    | 0.0    |
| 69°   | 15563.3 | 4370.1 | 231.5  | 138.5  | 89.0   | 73.2   | 45.5   | 21.8   | 4.0    | 0.0    | 0.0    |
| 70°   | 14934.2 | 3996.2 | 203.8  | 122.7  | 81.1   | 69.2   | 43.5   | 15.8   | 4.0    | 0.0    | 0.0    |
| 72.5° | 12340.7 | 2844.8 | 154.3  | 91.0   | 59.3   | 61.3   | 39.6   | 9.9    | 4.0    | 0.0    | 0.0    |
| 75°   | 8989.4  | 1729.0 | 110.8  | 63.3   | 37.6   | 45.5   | 27.7   | 4.0    | 2.0    | 0.0    | 0.0    |
| 77.5° | 5001.2  | 815.1  | 69.2   | 35.6   | 23.7   | 27.7   | 13.8   | 0.0    | 0.0    | 0.0    | 0.0    |
| 80°   | 1624.2  | 221.6  | 31.7   | 19.8   | 13.8   | 15.8   | 5.9    | 0.0    | 0.0    | 0.0    | 0.0    |
| 82.5° | 300.7   | 63.3   | 17.8   | 9.9    | 4.0    | 4.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 85°   | 65.3    | 25.7   | 9.9    | 4.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 87.5° | 21.8    | 7.9    | 2.0    | 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    |



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

Report Prepared for

Cooper Lighting Solutions

McGRAW-EDISON

Report Number: SP1-1908-441-1-R4

Test Date: 08/20/2019

Luminaire Tested: SA1C-727-U-5WQ

**Test Information**

Test Method: LM-79-2008  
 Report Number: SP1-1908-441-1-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-727-U-5WQ**  
 Description: McGRAW EDISON ROADWAY AND AREA LUMINAIRE

\*\*\*THIS IS A REVISION OF SP1-1908-441-1-R3. TO UPDATE THE CATALOG NUMBER.\*\*\*TESTED IN  
 SITU. (1) 70 CRI, 2700K, 1050MA LIGHTSQUARE WITH 16 LEDS AND TYPE V WIDE OPTICS.

**Spectral Parameters**

CCT (K): 2741  
 CIE u': 0.2605  
 CIE v': 0.5272  
 Duv: 0.0005  
 CIE x: 0.4573  
 CIE y: 0.4113  
 CIE z: 0.1313  
 Peak Wavelength (nm): 602  
 Dominant Wavelength (nm): 583  
 Purity: 61.2

|           |      |      |       |
|-----------|------|------|-------|
| CRI (Ra): | 71.5 |      |       |
| R1:       | 69.2 | R9:  | -16.1 |
| R2:       | 79.4 | R10: | 51.4  |
| R3:       | 87.8 | R11: | 63.1  |
| R4:       | 69.4 | R12: | 42.0  |
| R5:       | 66.4 | R13: | 70.2  |
| R6:       | 69.8 | R14: | 92.4  |
| R7:       | 79.8 |      |       |
| R8:       | 50.1 |      |       |

Rf: 69.9  
 Rg: 98.3



**Test Conditions**

Stabilization Time: 56M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 25.3./42%  
 Sphere Temperature (°C): 25.7

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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 2700K 4-step quadrangle

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**Photopic Flux vs. Wavelength**



**Photopic Lumens: 6211.7**

| $\lambda$ (nm) | Power ( $\mu\text{W}/\text{nm}$ ) | Lumens ( $\phi/\text{nm}$ ) | $\lambda$ (nm) | Power ( $\mu\text{W}/\text{nm}$ ) | Lumens ( $\phi/\text{nm}$ ) | $\lambda$ (nm) | Power ( $\mu\text{W}/\text{nm}$ ) | Lumens ( $\phi/\text{nm}$ ) | $\lambda$ (nm) | Power ( $\mu\text{W}/\text{nm}$ ) | Lumens ( $\phi/\text{nm}$ ) | $\lambda$ (nm) | Power ( $\mu\text{W}/\text{nm}$ ) | Lumens ( $\phi/\text{nm}$ ) |
|----------------|-----------------------------------|-----------------------------|----------------|-----------------------------------|-----------------------------|----------------|-----------------------------------|-----------------------------|----------------|-----------------------------------|-----------------------------|----------------|-----------------------------------|-----------------------------|
| 360            | 2044                              | 0.0                         | 490            | 7179                              | 1.0                         | 620            | 118034                            | 30.7                        | 750            | 8362                              | 0.0                         | 880            | 3128                              | 0.0                         |
| 365            | 2016                              | 0.0                         | 495            | 10476                             | 1.9                         | 625            | 111884                            | 24.7                        | 755            | 7635                              | 0.0                         | 885            | 3110                              | 0.0                         |
| 370            | 2020                              | 0.0                         | 500            | 15549                             | 3.4                         | 630            | 106119                            | 19.2                        | 760            | 6582                              | 0.0                         | 890            | 2632                              | 0.0                         |
| 375            | 2137                              | 0.0                         | 505            | 22477                             | 6.3                         | 635            | 99706                             | 15.0                        | 765            | 5777                              | 0.0                         | 895            | 2709                              | 0.0                         |
| 380            | 2046                              | 0.0                         | 510            | 30417                             | 10.4                        | 640            | 92142                             | 11.0                        | 770            | 5474                              | 0.0                         | 900            | 2016                              | 0.0                         |
| 385            | 1925                              | 0.0                         | 515            | 39274                             | 16.3                        | 645            | 84987                             | 8.2                         | 775            | 4977                              | 0.0                         | 905            | 1748                              | 0.0                         |
| 390            | 1893                              | 0.0                         | 520            | 47282                             | 22.9                        | 650            | 78016                             | 5.7                         | 780            | 4723                              | 0.0                         | 910            | 2046                              | 0.0                         |
| 395            | 1695                              | 0.0                         | 525            | 55413                             | 29.7                        | 655            | 71541                             | 4.1                         | 785            | 4219                              | 0.0                         | 915            | 1844                              | 0.0                         |
| 400            | 1633                              | 0.0                         | 530            | 62377                             | 36.7                        | 660            | 64863                             | 2.7                         | 790            | 3969                              | 0.0                         | 920            | 2734                              | 0.0                         |
| 405            | 2065                              | 0.0                         | 535            | 68520                             | 42.5                        | 665            | 58485                             | 1.9                         | 795            | 4122                              | 0.0                         | 925            | 2307                              | 0.0                         |
| 410            | 3449                              | 0.0                         | 540            | 73435                             | 47.8                        | 670            | 51641                             | 1.1                         | 800            | 2864                              | 0.0                         | 930            | 2039                              | 0.0                         |
| 415            | 7117                              | 0.0                         | 545            | 78677                             | 52.4                        | 675            | 46030                             | 0.8                         | 805            | 3151                              | 0.0                         | 935            | 1784                              | 0.0                         |
| 420            | 13992                             | 0.0                         | 550            | 83331                             | 56.6                        | 680            | 40590                             | 0.5                         | 810            | 3022                              | 0.0                         | 940            | 2464                              | 0.0                         |
| 425            | 25176                             | 0.1                         | 555            | 89120                             | 60.9                        | 685            | 35691                             | 0.3                         | 815            | 3471                              | 0.0                         | 945            | 2794                              | 0.0                         |
| 430            | 38151                             | 0.3                         | 560            | 94613                             | 64.3                        | 690            | 31631                             | 0.2                         | 820            | 2749                              | 0.0                         | 950            | 3090                              | 0.0                         |
| 435            | 49673                             | 0.6                         | 565            | 99818                             | 66.4                        | 695            | 27437                             | 0.1                         | 825            | 2729                              | 0.0                         | 955            | 1866                              | 0.0                         |
| 440            | 57273                             | 0.9                         | 570            | 106526                            | 69.3                        | 700            | 24589                             | 0.1                         | 830            | 2282                              | 0.0                         | 960            | 3110                              | 0.0                         |
| 445            | 54802                             | 1.1                         | 575            | 111610                            | 69.4                        | 705            | 21832                             | 0.0                         | 835            | 3140                              | 0.0                         | 965            | 3880                              | 0.0                         |
| 450            | 39184                             | 1.0                         | 580            | 117163                            | 69.6                        | 710            | 19500                             | 0.0                         | 840            | 2365                              | 0.0                         | 970            | 3243                              | 0.0                         |
| 455            | 22506                             | 0.8                         | 585            | 122201                            | 67.9                        | 715            | 17870                             | 0.0                         | 845            | 3024                              | 0.0                         | 975            | 2014                              | 0.0                         |
| 460            | 13692                             | 0.6                         | 590            | 125662                            | 65.0                        | 720            | 15924                             | 0.0                         | 850            | 2510                              | 0.0                         | 980            | 1688                              | 0.0                         |
| 465            | 9446                              | 0.5                         | 595            | 127415                            | 60.4                        | 725            | 14268                             | 0.0                         | 855            | 2739                              | 0.0                         | 985            | 2827                              | 0.0                         |
| 470            | 6698                              | 0.4                         | 600            | 129155                            | 55.7                        | 730            | 12438                             | 0.0                         | 860            | 3515                              | 0.0                         | 990            | 4172                              | 0.0                         |
| 475            | 5328                              | 0.4                         | 605            | 128057                            | 49.6                        | 735            | 11255                             | 0.0                         | 865            | 3600                              | 0.0                         | 995            | 3177                              | 0.0                         |
| 480            | 5081                              | 0.5                         | 610            | 126031                            | 43.3                        | 740            | 9951                              | 0.0                         | 870            | 3609                              | 0.0                         | 1000           | 3241                              | 0.0                         |
| 485            | 5579                              | 0.7                         | 615            | 123059                            | 37.1                        | 745            | 8870                              | 0.0                         | 875            | 3208                              | 0.0                         |                |                                   |                             |

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Scotopic Flux vs. Wavelength



Scotopic Lumens: 6474.3

S/P: 1.04

| 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    | 2044          | 0.0           | 490    | 7179          | 6.0           | 620    | 118034        | 0.1           | 750    | 8362          | 0.0           | 880    | 3128          | 0.0           |
| 365    | 2016          | 0.0           | 495    | 10476         | 8.6           | 625    | 111884        | 0.1           | 755    | 7635          | 0.0           | 885    | 3110          | 0.0           |
| 370    | 2020          | 0.0           | 500    | 15549         | 12.5          | 630    | 106119        | 0.0           | 760    | 6582          | 0.0           | 890    | 2632          | 0.0           |
| 375    | 2137          | 0.0           | 505    | 22477         | 17.3          | 635    | 99706         | 0.0           | 765    | 5777          | 0.0           | 895    | 2709          | 0.0           |
| 380    | 2046          | 0.0           | 510    | 30417         | 21.8          | 640    | 92142         | 0.0           | 770    | 5474          | 0.0           | 900    | 2016          | 0.0           |
| 385    | 1925          | 0.0           | 515    | 39274         | 25.7          | 645    | 84987         | 0.0           | 775    | 4977          | 0.0           | 905    | 1748          | 0.0           |
| 390    | 1893          | 0.0           | 520    | 47282         | 27.5          | 650    | 78016         | 0.0           | 780    | 4723          | 0.0           | 910    | 2046          | 0.0           |
| 395    | 1695          | 0.0           | 525    | 55413         | 28.1          | 655    | 71541         | 0.0           | 785    | 4219          | 0.0           | 915    | 1844          | 0.0           |
| 400    | 1633          | 0.0           | 530    | 62377         | 27.0          | 660    | 64863         | 0.0           | 790    | 3969          | 0.0           | 920    | 2734          | 0.0           |
| 405    | 2065          | 0.0           | 535    | 68520         | 24.7          | 665    | 58485         | 0.0           | 795    | 4122          | 0.0           | 925    | 2307          | 0.0           |
| 410    | 3449          | 0.1           | 540    | 73435         | 21.5          | 670    | 51641         | 0.0           | 800    | 2864          | 0.0           | 930    | 2039          | 0.0           |
| 415    | 7117          | 0.5           | 545    | 78677         | 18.3          | 675    | 46030         | 0.0           | 805    | 3151          | 0.0           | 935    | 1784          | 0.0           |
| 420    | 13992         | 1.6           | 550    | 83331         | 15.0          | 680    | 40590         | 0.0           | 810    | 3022          | 0.0           | 940    | 2464          | 0.0           |
| 425    | 25176         | 3.9           | 555    | 89120         | 12.0          | 685    | 35691         | 0.0           | 815    | 3471          | 0.0           | 945    | 2794          | 0.0           |
| 430    | 38151         | 8.1           | 560    | 94613         | 9.3           | 690    | 31631         | 0.0           | 820    | 2749          | 0.0           | 950    | 3090          | 0.0           |
| 435    | 49673         | 13.3          | 565    | 99818         | 7.0           | 695    | 27437         | 0.0           | 825    | 2729          | 0.0           | 955    | 1866          | 0.0           |
| 440    | 57273         | 19.1          | 570    | 106526        | 5.2           | 700    | 24589         | 0.0           | 830    | 2282          | 0.0           | 960    | 3110          | 0.0           |
| 445    | 54802         | 21.6          | 575    | 111610        | 3.7           | 705    | 21832         | 0.0           | 835    | 3140          | 0.0           | 965    | 3880          | 0.0           |
| 450    | 39184         | 18.1          | 580    | 117163        | 2.6           | 710    | 19500         | 0.0           | 840    | 2365          | 0.0           | 970    | 3243          | 0.0           |
| 455    | 22506         | 11.8          | 585    | 122201        | 1.8           | 715    | 17870         | 0.0           | 845    | 3024          | 0.0           | 975    | 2014          | 0.0           |
| 460    | 13692         | 8.1           | 590    | 125662        | 1.2           | 720    | 15924         | 0.0           | 850    | 2510          | 0.0           | 980    | 1688          | 0.0           |
| 465    | 9446          | 6.2           | 595    | 127415        | 0.8           | 725    | 14268         | 0.0           | 855    | 2739          | 0.0           | 985    | 2827          | 0.0           |
| 470    | 6698          | 4.8           | 600    | 129155        | 0.5           | 730    | 12438         | 0.0           | 860    | 3515          | 0.0           | 990    | 4172          | 0.0           |
| 475    | 5328          | 4.1           | 605    | 128057        | 0.4           | 735    | 11255         | 0.0           | 865    | 3600          | 0.0           | 995    | 3177          | 0.0           |
| 480    | 5081          | 4.1           | 610    | 126031        | 0.2           | 740    | 9951          | 0.0           | 870    | 3609          | 0.0           | 1000   | 3241          | 0.0           |
| 485    | 5579          | 4.6           | 615    | 123059        | 0.1           | 745    | 8870          | 0.0           | 875    | 3208          | 0.0           |        |               |               |

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Melanopic Flux vs. Wavelength



Melanopic Lumens: 2145.7 M/P: 0.35

| $\lambda$ (nm) | Power ( $\mu\text{W}/\text{nm}$ ) | Lumens ( $\phi/\text{nm}$ ) | $\lambda$ (nm) | Power ( $\mu\text{W}/\text{nm}$ ) | Lumens ( $\phi/\text{nm}$ ) | $\lambda$ (nm) | Power ( $\mu\text{W}/\text{nm}$ ) | Lumens ( $\phi/\text{nm}$ ) | $\lambda$ (nm) | Power ( $\mu\text{W}/\text{nm}$ ) | Lumens ( $\phi/\text{nm}$ ) | $\lambda$ (nm) | Power ( $\mu\text{W}/\text{nm}$ ) | Lumens ( $\phi/\text{nm}$ ) |
|----------------|-----------------------------------|-----------------------------|----------------|-----------------------------------|-----------------------------|----------------|-----------------------------------|-----------------------------|----------------|-----------------------------------|-----------------------------|----------------|-----------------------------------|-----------------------------|
| 360            | 2044                              | 0.0                         | 490            | 7179                              | 11.1                        | 620            | 118034                            | 1.5                         | 750            | 8362                              | 0.0                         | 880            | 3128                              | 0.0                         |
| 365            | 2016                              | 0.0                         | 495            | 10476                             | 16.9                        | 625            | 111884                            | 0.9                         | 755            | 7635                              | 0.0                         | 885            | 3110                              | 0.0                         |
| 370            | 2020                              | 0.0                         | 500            | 15549                             | 26.0                        | 630            | 106119                            | 0.6                         | 760            | 6582                              | 0.0                         | 890            | 2632                              | 0.0                         |
| 375            | 2137                              | 0.0                         | 505            | 22477                             | 38.2                        | 635            | 99706                             | 0.4                         | 765            | 5777                              | 0.0                         | 895            | 2709                              | 0.0                         |
| 380            | 2046                              | 0.0                         | 510            | 30417                             | 51.6                        | 640            | 92142                             | 0.2                         | 770            | 5474                              | 0.0                         | 900            | 2016                              | 0.0                         |
| 385            | 1925                              | 0.0                         | 515            | 39274                             | 65.1                        | 645            | 84987                             | 0.1                         | 775            | 4977                              | 0.0                         | 905            | 1748                              | 0.0                         |
| 390            | 1893                              | 0.0                         | 520            | 47282                             | 75.2                        | 650            | 78016                             | 0.1                         | 780            | 4723                              | 0.0                         | 910            | 2046                              | 0.0                         |
| 395            | 1695                              | 0.0                         | 525            | 55413                             | 82.9                        | 655            | 71541                             | 0.1                         | 785            | 4219                              | 0.0                         | 915            | 1844                              | 0.0                         |
| 400            | 1633                              | 0.0                         | 530            | 62377                             | 86.0                        | 660            | 64863                             | 0.0                         | 790            | 3969                              | 0.0                         | 920            | 2734                              | 0.0                         |
| 405            | 2065                              | 0.1                         | 535            | 68520                             | 85.4                        | 665            | 58485                             | 0.0                         | 795            | 4122                              | 0.0                         | 925            | 2307                              | 0.0                         |
| 410            | 3449                              | 0.2                         | 540            | 73435                             | 81.1                        | 670            | 51641                             | 0.0                         | 800            | 2864                              | 0.0                         | 930            | 2039                              | 0.0                         |
| 415            | 7117                              | 0.7                         | 545            | 78677                             | 75.4                        | 675            | 46030                             | 0.0                         | 805            | 3151                              | 0.0                         | 935            | 1784                              | 0.0                         |
| 420            | 13992                             | 2.3                         | 550            | 83331                             | 68.1                        | 680            | 40590                             | 0.0                         | 810            | 3022                              | 0.0                         | 940            | 2464                              | 0.0                         |
| 425            | 25176                             | 6.2                         | 555            | 89120                             | 60.9                        | 685            | 35691                             | 0.0                         | 815            | 3471                              | 0.0                         | 945            | 2794                              | 0.0                         |
| 430            | 38151                             | 13.0                        | 560            | 94613                             | 52.9                        | 690            | 31631                             | 0.0                         | 820            | 2749                              | 0.0                         | 950            | 3090                              | 0.0                         |
| 435            | 49673                             | 22.2                        | 565            | 99818                             | 44.8                        | 695            | 27437                             | 0.0                         | 825            | 2729                              | 0.0                         | 955            | 1866                              | 0.0                         |
| 440            | 57273                             | 32.0                        | 570            | 106526                            | 37.6                        | 700            | 24589                             | 0.0                         | 830            | 2282                              | 0.0                         | 960            | 3110                              | 0.0                         |
| 445            | 54802                             | 36.7                        | 575            | 111610                            | 30.4                        | 705            | 21832                             | 0.0                         | 835            | 3140                              | 0.0                         | 965            | 3880                              | 0.0                         |
| 450            | 39184                             | 30.4                        | 580            | 117163                            | 24.1                        | 710            | 19500                             | 0.0                         | 840            | 2365                              | 0.0                         | 970            | 3243                              | 0.0                         |
| 455            | 22506                             | 19.7                        | 585            | 122201                            | 18.7                        | 715            | 17870                             | 0.0                         | 845            | 3024                              | 0.0                         | 975            | 2014                              | 0.0                         |
| 460            | 13692                             | 13.2                        | 590            | 125662                            | 14.0                        | 720            | 15924                             | 0.0                         | 850            | 2510                              | 0.0                         | 980            | 1688                              | 0.0                         |
| 465            | 9446                              | 10.0                        | 595            | 127415                            | 10.2                        | 725            | 14268                             | 0.0                         | 855            | 2739                              | 0.0                         | 985            | 2827                              | 0.0                         |
| 470            | 6698                              | 7.7                         | 600            | 129155                            | 7.3                         | 730            | 12438                             | 0.0                         | 860            | 3515                              | 0.0                         | 990            | 4172                              | 0.0                         |
| 475            | 5328                              | 6.7                         | 605            | 128057                            | 5.0                         | 735            | 11255                             | 0.0                         | 865            | 3600                              | 0.0                         | 995            | 3177                              | 0.0                         |
| 480            | 5081                              | 6.9                         | 610            | 126031                            | 3.4                         | 740            | 9951                              | 0.0                         | 870            | 3609                              | 0.0                         | 1000           | 3241                              | 0.0                         |
| 485            | 5579                              | 8.1                         | 615            | 123059                            | 2.3                         | 745            | 8870                              | 0.0                         | 875            | 3208                              | 0.0                         |                |                                   |                             |

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**Summary**

$R_f = 69.9$   
 $R_g = 98.3$   
 CIE  $R_a = 71.5$   
 $R_g = -16.1$



**Color Vector Graphics**





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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 54 | CES51 = 77 | CES76 = 48 |
| CES02 = 63 | CES27 = 74 | CES52 = 80 | CES77 = 75 |
| CES03 = 31 | CES28 = 80 | CES53 = 66 | CES78 = 56 |
| CES04 = 71 | CES29 = 44 | CES54 = 77 | CES79 = 81 |
| CES05 = 50 | CES30 = 46 | CES55 = 74 | CES80 = 80 |
| CES06 = 52 | CES31 = 50 | CES56 = 63 | CES81 = 73 |
| CES07 = 42 | CES32 = 49 | CES57 = 60 | CES82 = 91 |
| CES08 = 41 | CES33 = 53 | CES58 = 63 | CES83 = 84 |
| CES09 = 29 | CES34 = 66 | CES59 = 85 | CES84 = 90 |
| CES10 = 77 | CES35 = 82 | CES60 = 89 | CES85 = 87 |
| CES11 = 60 | CES36 = 78 | CES61 = 85 | CES86 = 65 |
| CES12 = 66 | CES37 = 75 | CES62 = 69 | CES87 = 78 |
| CES13 = 43 | CES38 = 53 | CES63 = 68 | CES88 = 73 |
| CES14 = 74 | CES39 = 91 | CES64 = 68 | CES89 = 68 |
| CES15 = 71 | CES40 = 85 | CES65 = 65 | CES90 = 68 |
| CES16 = 48 | CES41 = 76 | CES66 = 62 | CES91 = 91 |
| CES17 = 50 | CES42 = 76 | CES67 = 60 | CES92 = 71 |
| CES18 = 57 | CES43 = 65 | CES68 = 68 | CES93 = 82 |
| CES19 = 73 | CES44 = 98 | CES69 = 77 | CES94 = 57 |
| CES20 = 67 | CES45 = 75 | CES70 = 60 | CES95 = 78 |
| CES21 = 88 | CES46 = 70 | CES71 = 57 | CES96 = 80 |
| CES22 = 80 | CES47 = 63 | CES72 = 86 | CES97 = 79 |
| CES23 = 92 | CES48 = 51 | CES73 = 52 | CES98 = 71 |
| CES24 = 91 | CES49 = 68 | CES74 = 90 | CES99 = 64 |
| CES25 = 73 | CES50 = 77 | CES75 = 58 |            |



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Color Rendition by Hue-Angle Bin



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Measure Comparisons



(END OF REPORT)