

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: P322923

Luminaire Tested: **GLEON-SA9B-750-U-T4W-HSS**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P322923  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-19)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA9B-750-U-T4W-HSS  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(9) 70 CRI, 5000K, 800mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE IV WIDE OPTICS WITH HOUSE SIDE SHIELD  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 37028 lumens  
Efficiency: N/A  
Efficacy: 99.0 lumens/watt  
Luminous Opening: Rectangular (W 2.5' x L: 1' x H: 0')  
IES Classification: Type IV - Short  
BUG Rating: B3 - U0 - G5

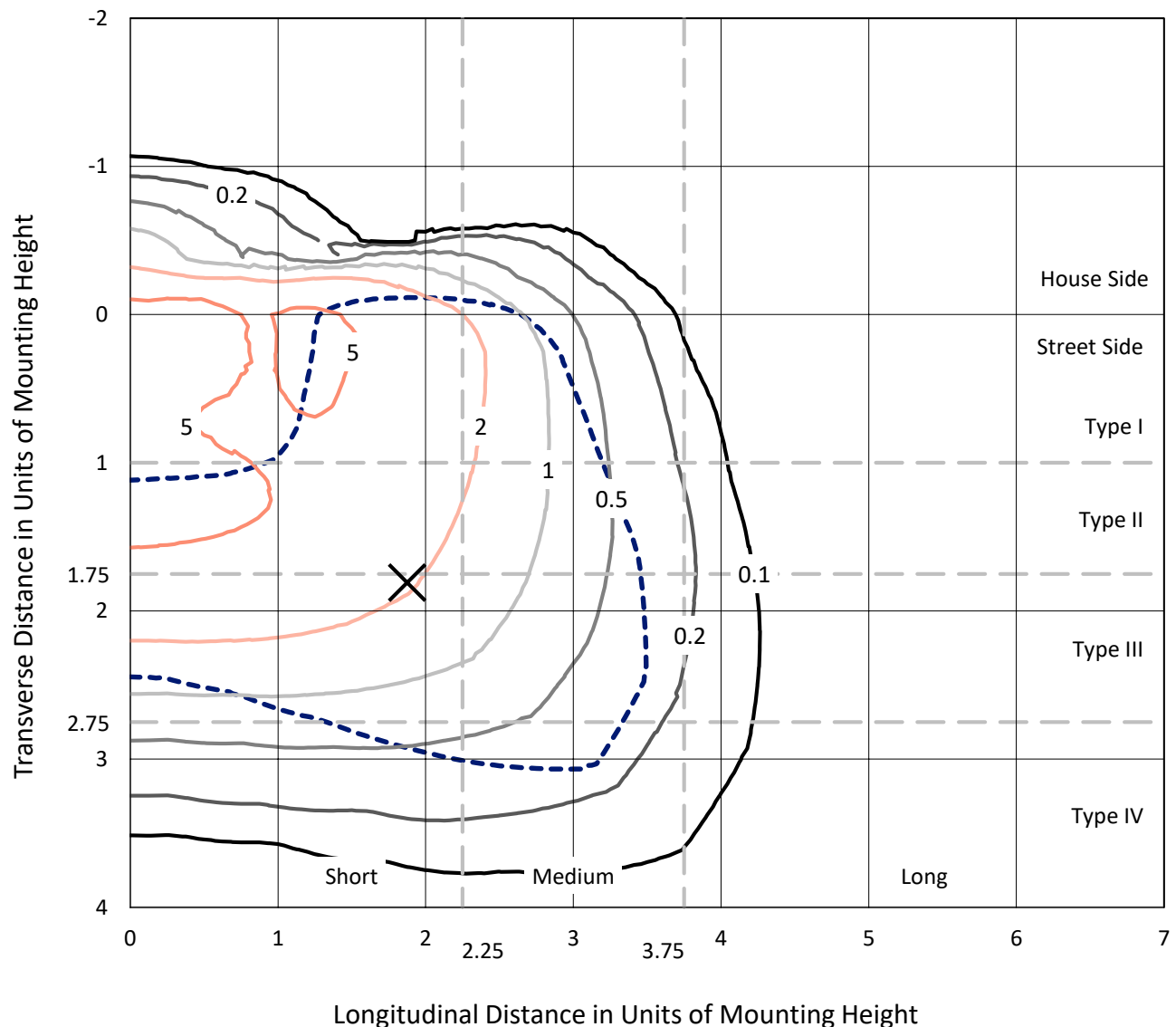
Input Watts (W): 374  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



REPORT NUMBER: P322923  
 CATALOG NUMBER: GLEON-SA9B-750-U-T4W-HSS

## Iso-Footcandle Lines of Horizontal Illumination

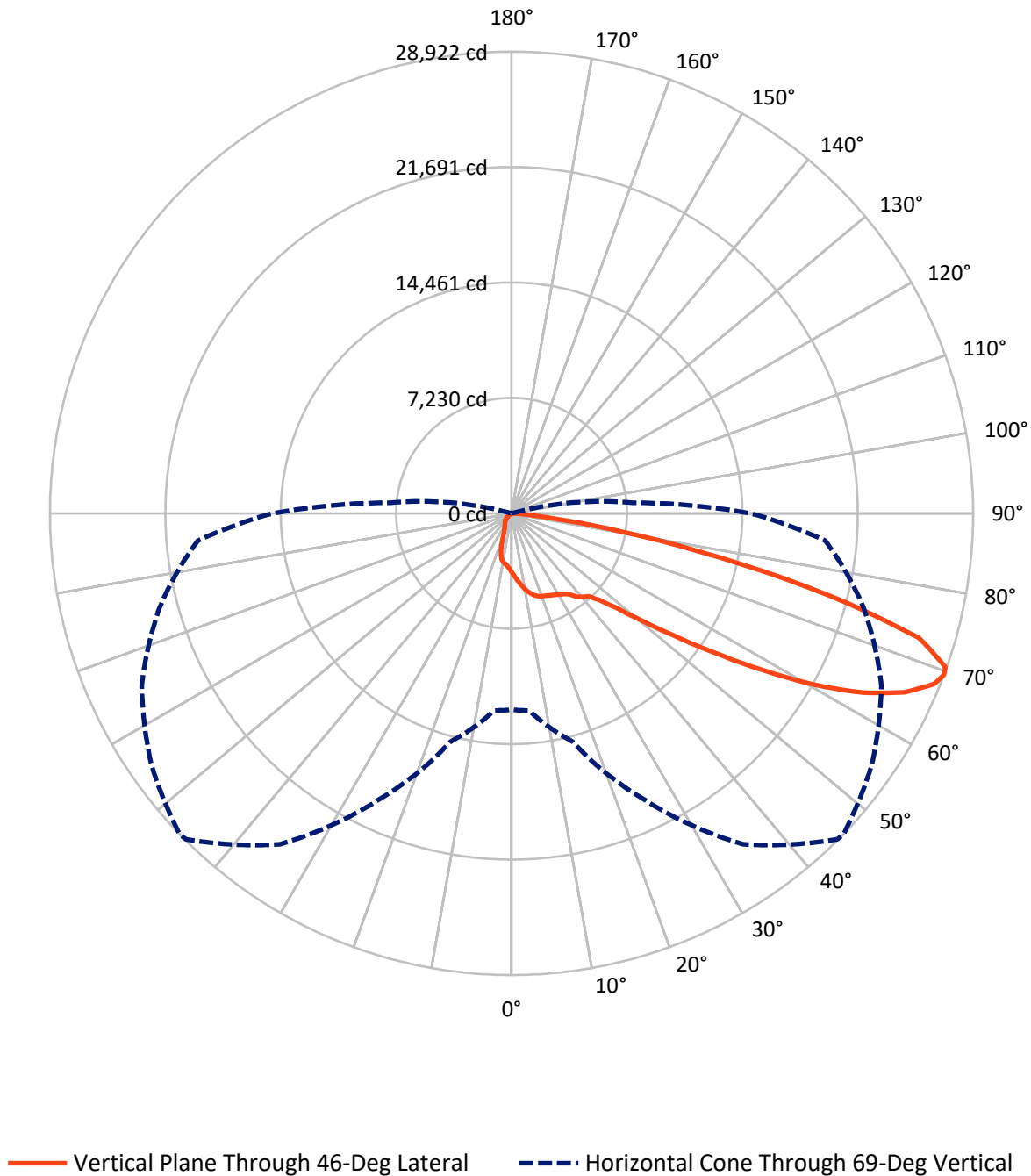
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 8.6 fc  
 Type IV - Short - N/A

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## Luminous Intensity Polar Plot



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**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 3800.1   | 0.0    | 3800.1  |
|                    | % Fixture | 10.3     | 0.0    | 10.3    |
| <b>Street Side</b> | Lumens    | 33227.9  | 0.0    | 33227.9 |
|                    | % Fixture | 89.7     | 0.0    | 89.7    |
| <b>Total</b>       | Lumens    | 37028.0  | 0.0    | 37028.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 369.3   | 1.0       |
| 10°-20°   | 1120.3  | 3.0       |
| 20°-30°   | 1761.9  | 4.8       |
| 30°-40°   | 2526.5  | 6.8       |
| 40°-50°   | 4366.8  | 11.8      |
| 50°-60°   | 8627.0  | 23.3      |
| 60°-70°   | 12057.0 | 32.6      |
| 70°-80°   | 5824.8  | 15.7      |
| 80°-90°   | 374.4   | 1.0       |
| 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°    | 37028.0 | 100.0     |
| 0°-180°   | 37028.0 | 100.0     |

**Coefficient of Utilization**



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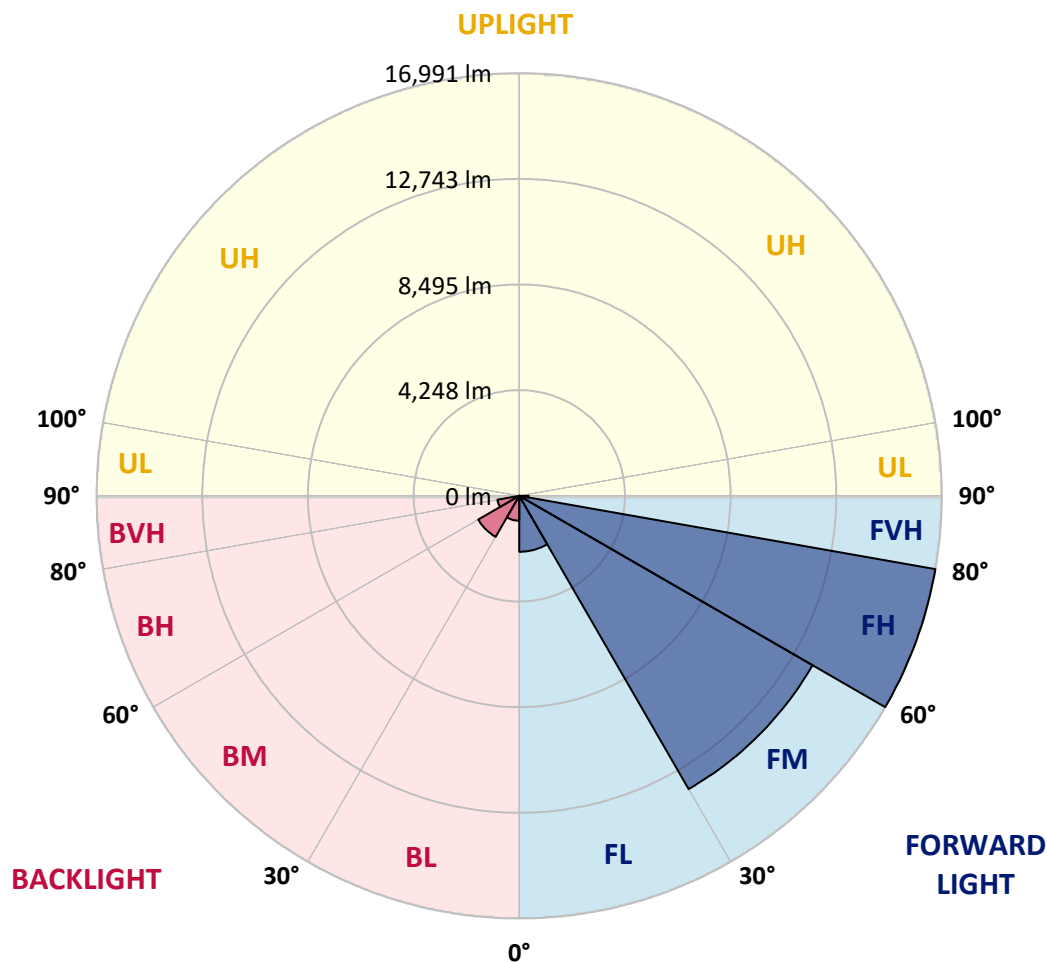
CATALOG NUMBER: GLEON-SA9B-750-U-T4W-HSS

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

| Zone |             | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|---------|-----------|-------------------------|------|---------|
|      |             |         |           | B                       | U    | G       |
| FL   | (0°-30°)    | 2249.9  | 6.1       |                         |      |         |
| FM   | (30°-60°)   | 13616.0 | 36.8      |                         |      |         |
| FH   | (60°-80°)   | 16990.8 | 45.9      |                         |      | G5      |
| FVH  | (80°-90°)   | 371.2   | 1.0       |                         |      | G3/500  |
| BL   | (0°-30°)    | 1001.6  | 2.7       | B3/2500                 |      |         |
| BM   | (30°-60°)   | 1904.3  | 5.1       | B2/2500                 |      |         |
| BH   | (60°-80°)   | 891.0   | 2.4       | B2/1000                 |      | G2/1000 |
| BVH  | (80°-90°)   | 3.1     | 0.0       |                         |      | G0/10   |
| UL   | (90°-100°)  | 0.0     | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0     | 0.0       |                         | U0/0 |         |

**BUG Rating: B3-U0-G5**

Type IV Short





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 45°     | 46°     | 55°     | 65°     | 75°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 3710.1  | 3710.1  | 3710.1  | 3710.1  | 3710.1  | 3710.1  | 3710.1  | 3710.1  | 3710.1  | 3710.1  | 3710.1  |
| 2.5°  | 4121.5  | 4116.3  | 4092.0  | 4081.6  | 4022.6  | 3987.8  | 3974.0  | 3930.6  | 3868.1  | 3805.6  | 3736.1  |
| 5°    | 4590.3  | 4588.5  | 4543.4  | 4500.0  | 4388.9  | 4284.7  | 4265.6  | 4164.9  | 4024.3  | 3892.4  | 3760.4  |
| 7.5°  | 5069.4  | 5046.9  | 5001.7  | 4918.4  | 4756.9  | 4590.3  | 4574.7  | 4432.3  | 4232.6  | 4041.7  | 3852.4  |
| 10°   | 5475.7  | 5461.8  | 5402.8  | 5276.0  | 5086.8  | 4897.6  | 4878.5  | 4703.1  | 4477.4  | 4243.1  | 4001.7  |
| 12.5° | 5791.7  | 5781.2  | 5703.1  | 5545.1  | 5343.7  | 5147.6  | 5121.5  | 4965.3  | 4724.0  | 4461.8  | 4177.1  |
| 15°   | 5984.4  | 5979.2  | 5883.7  | 5715.3  | 5517.4  | 5347.2  | 5324.6  | 5187.5  | 4963.5  | 4689.2  | 4368.1  |
| 17.5° | 6029.5  | 6031.2  | 5932.3  | 5762.1  | 5599.0  | 5477.4  | 5460.1  | 5355.9  | 5168.4  | 4895.8  | 4559.0  |
| 20°   | 5928.8  | 5949.6  | 5861.1  | 5713.5  | 5612.8  | 5548.6  | 5534.7  | 5472.2  | 5314.2  | 5057.3  | 4711.8  |
| 22.5° | 5786.5  | 5796.9  | 5736.1  | 5637.1  | 5595.5  | 5607.6  | 5600.7  | 5566.0  | 5432.3  | 5196.2  | 4862.8  |
| 25°   | 5699.6  | 5699.6  | 5663.2  | 5579.9  | 5607.6  | 5682.3  | 5684.0  | 5677.1  | 5571.2  | 5366.3  | 5046.9  |
| 27.5° | 5696.2  | 5685.8  | 5644.1  | 5581.6  | 5658.0  | 5772.6  | 5779.5  | 5826.4  | 5760.4  | 5572.9  | 5276.0  |
| 30°   | 5835.1  | 5822.9  | 5734.4  | 5652.8  | 5750.0  | 5873.3  | 5890.6  | 5993.1  | 5960.1  | 5796.9  | 5531.2  |
| 32.5° | 6159.7  | 6116.3  | 5920.1  | 5786.5  | 5859.4  | 6006.9  | 6029.5  | 6192.7  | 6244.8  | 6072.9  | 5777.8  |
| 35°   | 6604.2  | 6467.0  | 6184.0  | 6039.9  | 6046.9  | 6201.4  | 6222.2  | 6461.8  | 6616.3  | 6326.4  | 5968.7  |
| 37.5° | 7217.0  | 7149.3  | 6689.2  | 6303.8  | 6335.1  | 6569.4  | 6630.2  | 6890.6  | 6847.2  | 6465.3  | 6185.8  |
| 40°   | 8560.8  | 8454.9  | 7965.3  | 7043.4  | 6611.1  | 6868.1  | 6887.1  | 7026.0  | 7029.5  | 6779.5  | 6637.1  |
| 42.5° | 10390.6 | 10347.2 | 9831.6  | 8385.4  | 7154.5  | 7067.7  | 7102.4  | 7336.8  | 7599.0  | 7442.7  | 7435.8  |
| 45°   | 12416.7 | 12394.1 | 11847.2 | 10166.7 | 8253.5  | 7722.2  | 7765.6  | 8079.9  | 8581.6  | 8616.3  | 8836.8  |
| 47.5° | 14046.9 | 14036.4 | 13722.2 | 12154.5 | 9935.8  | 8831.6  | 8845.5  | 9178.8  | 10060.8 | 10496.5 | 10849.0 |
| 50°   | 15533.0 | 15583.3 | 15335.1 | 14305.5 | 12227.4 | 10569.4 | 10536.5 | 10758.7 | 12175.3 | 12888.9 | 13326.4 |
| 52.5° | 17598.9 | 17670.1 | 16973.9 | 16312.5 | 14631.9 | 12725.7 | 12699.6 | 12932.3 | 14717.0 | 15251.7 | 15329.9 |
| 55°   | 19423.6 | 19302.1 | 18751.7 | 18560.8 | 17564.2 | 15388.9 | 15381.9 | 15586.8 | 17175.3 | 17402.8 | 17546.9 |
| 57.5° | 20229.2 | 20182.3 | 20447.9 | 20885.4 | 20635.4 | 18536.4 | 18520.8 | 18364.6 | 19375.0 | 19399.3 | 19842.0 |
| 60°   | 20737.8 | 20795.1 | 21609.4 | 22958.3 | 23581.6 | 21923.6 | 21822.9 | 20869.8 | 21475.7 | 21421.9 | 21895.8 |
| 62.5° | 20355.9 | 20468.7 | 21934.0 | 24182.3 | 25786.4 | 24880.2 | 24737.8 | 23164.9 | 23270.8 | 23085.1 | 23526.0 |
| 65°   | 18328.1 | 18503.5 | 20904.5 | 23951.4 | 26880.2 | 27191.0 | 27046.9 | 25191.0 | 24696.2 | 24390.6 | 24145.8 |
| 67.5° | 14881.9 | 14986.1 | 17493.0 | 21942.7 | 26387.1 | 28569.4 | 28539.9 | 26967.0 | 25772.6 | 24170.1 | 22270.8 |
| 69°   | 12298.6 | 12401.0 | 14814.2 | 19828.1 | 25302.1 | 28864.6 | 28921.9 | 27536.4 | 25567.7 | 22829.8 | 19732.6 |
| 70°   | 10416.7 | 10526.0 | 12774.3 | 18015.6 | 24043.4 | 28727.4 | 28829.8 | 27482.6 | 24980.9 | 21277.8 | 17505.2 |
| 72.5° | 5463.5  | 5557.3  | 7864.6  | 12411.5 | 19600.7 | 26378.5 | 26689.2 | 25159.7 | 21175.3 | 15453.1 | 10350.7 |
| 75°   | 1717.0  | 1770.8  | 3071.2  | 6487.8  | 13420.1 | 20510.4 | 20581.6 | 19736.1 | 15036.4 | 8500.0  | 4310.8  |
| 77.5° | 654.5   | 638.9   | 1022.6  | 2390.6  | 6784.7  | 12914.9 | 13350.7 | 12333.3 | 7890.6  | 3005.2  | 994.8   |
| 80°   | 352.4   | 354.2   | 531.2   | 989.6   | 2902.8  | 6637.1  | 7005.2  | 5977.4  | 2803.8  | 937.5   | 229.2   |
| 82.5° | 152.8   | 159.7   | 298.6   | 524.3   | 1333.3  | 2447.9  | 2631.9  | 2191.0  | 1071.2  | 630.2   | 85.1    |
| 85°   | 33.0    | 36.5    | 144.1   | 284.7   | 543.4   | 687.5   | 720.5   | 710.1   | 682.3   | 489.6   | 33.0    |
| 87.5° | 0.0     | 0.0     | 64.2    | 102.4   | 137.2   | 156.2   | 137.2   | 178.8   | 376.7   | 329.9   | 17.4    |
| 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: P322923

CATALOG NUMBER: GLEON-SA9B-750-U-T4W-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°     | 95°     | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|---------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 3710.1  | 3710.1  | 3710.1 | 3710.1 | 3710.1 | 3710.1 | 3710.1 | 3710.1 | 3710.1 | 3710.1 | 3710.1 |
| 2.5°  | 3713.5  | 3682.3  | 3628.5 | 3569.4 | 3527.8 | 3484.4 | 3449.7 | 3434.0 | 3416.7 | 3404.5 | 3420.1 |
| 5°    | 3706.6  | 3645.8  | 3541.7 | 3441.0 | 3368.1 | 3309.0 | 3260.4 | 3241.3 | 3222.2 | 3208.3 | 3206.6 |
| 7.5°  | 3767.4  | 3682.3  | 3522.6 | 3375.0 | 3262.2 | 3182.3 | 3116.3 | 3088.5 | 3066.0 | 3055.6 | 3046.9 |
| 10°   | 3883.7  | 3774.3  | 3560.8 | 3368.1 | 3222.2 | 3086.8 | 2944.4 | 2835.1 | 2763.9 | 2730.9 | 2718.7 |
| 12.5° | 4034.7  | 3897.6  | 3633.7 | 3404.5 | 3192.7 | 2932.3 | 2630.2 | 2369.8 | 2201.4 | 2145.8 | 2112.8 |
| 15°   | 4211.8  | 4041.7  | 3729.2 | 3451.4 | 3085.1 | 2609.4 | 2097.2 | 1756.9 | 1600.7 | 1569.4 | 1534.7 |
| 17.5° | 4381.9  | 4194.4  | 3843.7 | 3460.1 | 2849.0 | 2085.1 | 1536.5 | 1305.6 | 1244.8 | 1265.6 | 1270.8 |
| 20°   | 4531.2  | 4345.5  | 3956.6 | 3383.7 | 2420.1 | 1564.2 | 1189.2 | 1131.9 | 1154.5 | 1194.4 | 1201.4 |
| 22.5° | 4682.3  | 4491.3  | 4060.8 | 3182.3 | 1871.5 | 1187.5 | 1071.2 | 1085.1 | 1107.6 | 1147.6 | 1154.5 |
| 25°   | 4866.3  | 4668.4  | 4158.0 | 2812.5 | 1404.5 | 1010.4 | 1017.4 | 1038.2 | 1060.8 | 1097.2 | 1100.7 |
| 27.5° | 5078.1  | 4892.4  | 4222.2 | 2331.6 | 1041.7 | 928.8  | 951.4  | 982.6  | 1005.2 | 1039.9 | 1046.9 |
| 30°   | 5359.4  | 5187.5  | 4243.1 | 1833.3 | 873.3  | 855.9  | 866.3  | 904.5  | 937.5  | 968.7  | 974.0  |
| 32.5° | 5623.3  | 5479.2  | 4173.6 | 1383.7 | 809.0  | 788.2  | 788.2  | 810.8  | 849.0  | 878.5  | 885.4  |
| 35°   | 5866.3  | 5772.6  | 3951.4 | 1012.2 | 760.4  | 725.7  | 708.3  | 708.3  | 732.6  | 756.9  | 763.9  |
| 37.5° | 6187.5  | 6184.0  | 3592.0 | 807.3  | 713.5  | 673.6  | 637.2  | 609.4  | 600.7  | 605.9  | 609.4  |
| 40°   | 6737.8  | 6743.1  | 3123.3 | 724.0  | 673.6  | 619.8  | 564.2  | 513.9  | 467.0  | 451.4  | 449.7  |
| 42.5° | 7597.2  | 7519.1  | 2631.9 | 684.0  | 638.9  | 564.2  | 480.9  | 413.2  | 340.3  | 317.7  | 316.0  |
| 45°   | 8961.8  | 8498.3  | 2111.1 | 647.6  | 602.4  | 501.7  | 397.6  | 305.6  | 246.5  | 229.2  | 229.2  |
| 47.5° | 10949.6 | 9784.7  | 1635.4 | 607.6  | 553.8  | 430.6  | 300.3  | 220.5  | 180.6  | 171.9  | 173.6  |
| 50°   | 13005.2 | 11045.1 | 1253.5 | 557.3  | 494.8  | 355.9  | 222.2  | 159.7  | 137.2  | 137.2  | 138.9  |
| 52.5° | 14828.1 | 11968.7 | 977.4  | 503.5  | 421.9  | 279.5  | 168.4  | 125.0  | 114.6  | 112.8  | 114.6  |
| 55°   | 16534.7 | 12564.2 | 748.3  | 441.0  | 335.1  | 208.3  | 128.5  | 102.4  | 95.5   | 92.0   | 90.3   |
| 57.5° | 18180.5 | 12859.4 | 560.8  | 355.9  | 243.1  | 151.0  | 102.4  | 86.8   | 79.9   | 74.7   | 72.9   |
| 60°   | 19276.0 | 12619.8 | 385.4  | 262.2  | 168.4  | 109.4  | 85.1   | 74.7   | 66.0   | 60.8   | 59.0   |
| 62.5° | 19894.1 | 11965.3 | 248.3  | 189.2  | 119.8  | 81.6   | 67.7   | 62.5   | 50.3   | 45.1   | 45.1   |
| 65°   | 19644.1 | 10885.4 | 173.6  | 135.4  | 86.8   | 60.8   | 50.3   | 50.3   | 36.5   | 29.5   | 27.8   |
| 67.5° | 17408.0 | 9196.2  | 131.9  | 100.7  | 62.5   | 45.1   | 38.2   | 43.4   | 22.6   | 13.9   | 13.9   |
| 69°   | 14977.4 | 7621.5  | 112.8  | 83.3   | 52.1   | 36.5   | 33.0   | 39.9   | 15.6   | 10.4   | 8.7    |
| 70°   | 13017.4 | 6574.6  | 102.4  | 72.9   | 43.4   | 31.2   | 29.5   | 38.2   | 15.6   | 8.7    | 6.9    |
| 72.5° | 7788.2  | 3666.7  | 78.1   | 52.1   | 27.8   | 24.3   | 24.3   | 43.4   | 15.6   | 8.7    | 6.9    |
| 75°   | 3147.6  | 1291.7  | 57.3   | 36.5   | 20.8   | 20.8   | 29.5   | 55.6   | 13.9   | 6.9    | 5.2    |
| 77.5° | 713.5   | 283.0   | 33.0   | 22.6   | 13.9   | 20.8   | 34.7   | 43.4   | 8.7    | 3.5    | 0.0    |
| 80°   | 173.6   | 69.4    | 20.8   | 13.9   | 8.7    | 15.6   | 26.0   | 24.3   | 1.7    | 0.0    | 0.0    |
| 82.5° | 57.3    | 24.3    | 8.7    | 6.9    | 1.7    | 5.2    | 12.2   | 6.9    | 0.0    | 0.0    | 0.0    |
| 85°   | 24.3    | 13.9    | 3.5    | 1.7    | 0.0    | 0.0    | 1.7    | 0.0    | 0.0    | 0.0    | 0.0    |
| 87.5° | 15.6    | 5.2     | 0.0    | 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    |

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

Report Prepared for

Cooper Lighting Solutions

McGRAW-EDISON

Report Number: SP1-1908-441-4-R4

Test Date: 10/02/2019

Luminaire Tested: SA1C-750-U-5WQ

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

### Test Information

Test Method: LM-79-2008  
 Report Number: SP1-1908-441-4-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-750-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):                  | 4884   | CRI (Ra): | 73.5 |      |       |
| CIE u':                   | 0.2101 | R1:       | 70.5 | R9:  | -28.4 |
| CIE v':                   | 0.4904 | R2:       | 77.7 | R10: | 48.6  |
| Duv:                      | 0.0037 | R3:       | 84.6 | R11: | 73.2  |
| CIE x:                    | 0.3493 | R4:       | 74.7 | R12: | 50.7  |
| CIE y:                    | 0.3624 | R5:       | 71.9 | R13: | 71.2  |
| CIE z:                    | 0.2884 | R6:       | 70.7 | R14: | 91.4  |
| Peak Wavelength (nm):     | 444    | R7:       | 81.2 |      |       |
| Dominant Wavelength (nm): | 571    | R8:       | 56.9 |      |       |
| Purity:                   | 13.7   |           |      |      |       |
| Rf:                       | 74.9   |           |      |      |       |
| Rg:                       | 96.3   |           |      |      |       |



### Test Conditions

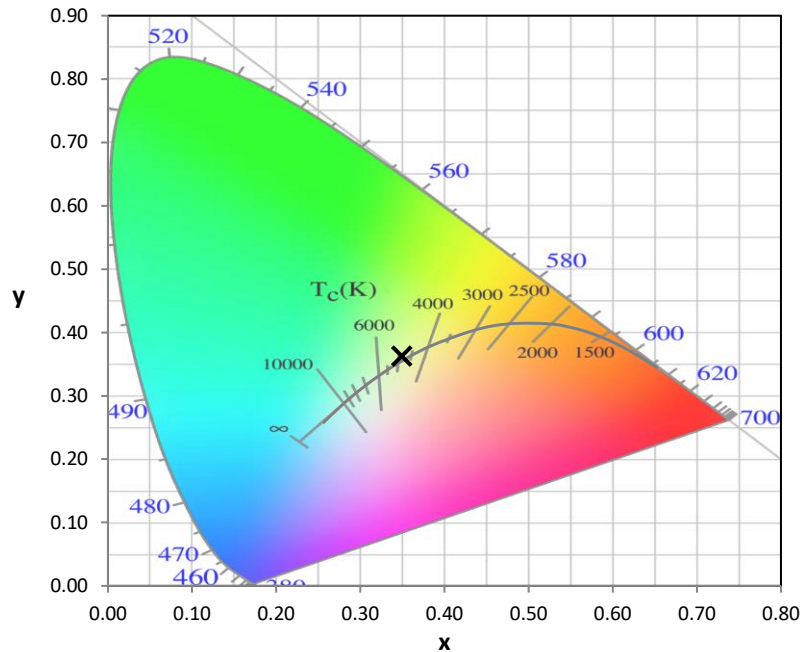
Stabilization Time: 240M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 25.0./44%  
 Sphere Temperature (°C): 25.7

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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 5000K 4-step quadrangle

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**Photopic Flux vs. Wavelength**



#####

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 2945             | NR               | 490       | 37941            | NR               | 620       | 88803            | NR               | 750       | 3908             | NR               | 880       | 2997             | NR               |
| 365       | 2596             | NR               | 495       | 48525            | NR               | 625       | 80578            | NR               | 755       | 3988             | NR               | 885       | 2927             | NR               |
| 370       | 2732             | NR               | 500       | 60609            | NR               | 630       | 73127            | NR               | 760       | 3335             | NR               | 890       | 2649             | NR               |
| 375       | 2894             | NR               | 505       | 72036            | NR               | 635       | 66244            | NR               | 765       | 3438             | NR               | 895       | 2828             | NR               |
| 380       | 2822             | NR               | 510       | 82168            | NR               | 640       | 59440            | NR               | 770       | 3427             | NR               | 900       | 1407             | NR               |
| 385       | 2394             | NR               | 515       | 90898            | NR               | 645       | 52864            | NR               | 775       | 2759             | NR               | 905       | 2224             | NR               |
| 390       | 2370             | NR               | 520       | 97142            | NR               | 650       | 47085            | NR               | 780       | 2340             | NR               | 910       | 2905             | NR               |
| 395       | 2267             | NR               | 525       | 103255           | NR               | 655       | 41789            | NR               | 785       | 2412             | NR               | 915       | 3350             | NR               |
| 400       | 2262             | NR               | 530       | 106697           | NR               | 660       | 37064            | NR               | 790       | 1999             | NR               | 920       | 3114             | NR               |
| 405       | 3000             | NR               | 535       | 110081           | NR               | 665       | 32299            | NR               | 795       | 2054             | NR               | 925       | 2834             | NR               |
| 410       | 5324             | NR               | 540       | 112494           | NR               | 670       | 28142            | NR               | 800       | 2331             | NR               | 930       | 2271             | NR               |
| 415       | 10725            | NR               | 545       | 115513           | NR               | 675       | 24505            | NR               | 805       | 2648             | NR               | 935       | 2228             | NR               |
| 420       | 22128            | NR               | 550       | 117203           | NR               | 680       | 21162            | NR               | 810       | 2485             | NR               | 940       | 2833             | NR               |
| 425       | 44095            | NR               | 555       | 119753           | NR               | 685       | 18400            | NR               | 815       | 2409             | NR               | 945       | 2941             | NR               |
| 430       | 77002            | NR               | 560       | 122602           | NR               | 690       | 16065            | NR               | 820       | 2221             | NR               | 950       | 2323             | NR               |
| 435       | 119881           | NR               | 565       | 124314           | NR               | 695       | 13860            | NR               | 825       | 1562             | NR               | 955       | 1667             | NR               |
| 440       | 164454           | NR               | 570       | 126775           | NR               | 700       | 12177            | NR               | 830       | 2249             | NR               | 960       | 749              | NR               |
| 445       | 179997           | NR               | 575       | 127511           | NR               | 705       | 10757            | NR               | 835       | 2573             | NR               | 965       | 2669             | NR               |
| 450       | 142822           | NR               | 580       | 127577           | NR               | 710       | 9601             | NR               | 840       | 2764             | NR               | 970       | 3968             | NR               |
| 455       | 90008            | NR               | 585       | 126153           | NR               | 715       | 8944             | NR               | 845       | 3109             | NR               | 975       | 3886             | NR               |
| 460       | 60557            | NR               | 590       | 123678           | NR               | 720       | 7947             | NR               | 850       | 2963             | NR               | 980       | 2788             | NR               |
| 465       | 43305            | NR               | 595       | 119774           | NR               | 725       | 7062             | NR               | 855       | 2336             | NR               | 985       | 3496             | NR               |
| 470       | 31089            | NR               | 600       | 115733           | NR               | 730       | 6004             | NR               | 860       | 2118             | NR               | 990       | 2913             | NR               |
| 475       | 26278            | NR               | 605       | 109231           | NR               | 735       | 5594             | NR               | 865       | 3144             | NR               | 995       | 4659             | NR               |
| 480       | 27060            | NR               | 610       | 102408           | NR               | 740       | 5165             | NR               | 870       | 3069             | NR               | 1000      | 1308             | NR               |
| 485       | 30698            | NR               | 615       | 96015            | NR               | 745       | 4687             | NR               | 875       | 3311             | NR               |           |                  |                  |

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Scotopic Flux vs. Wavelength



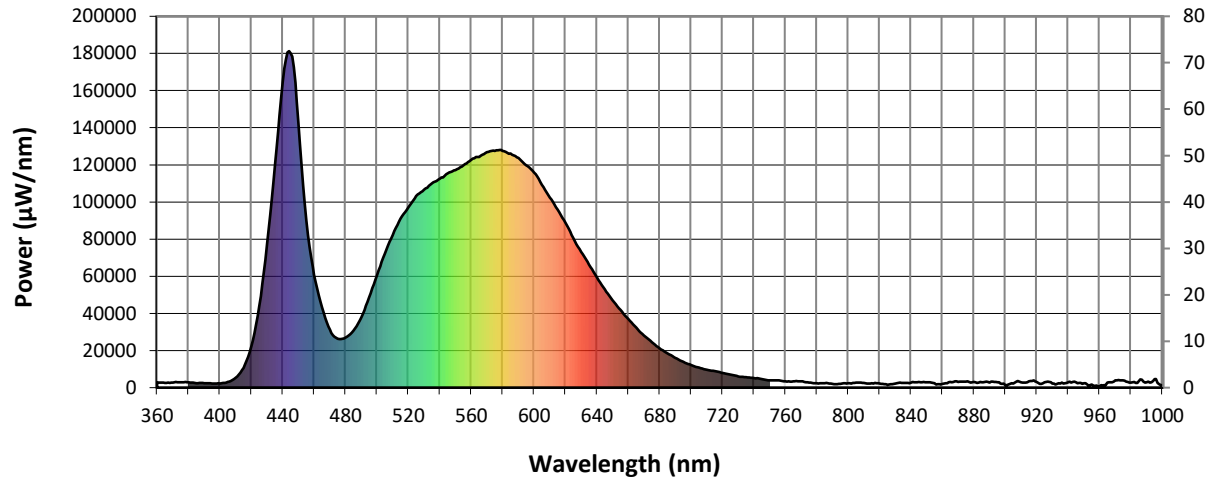
Scotopic Lumens: 13493.5

S/P: 1.77

| 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       | 2945             | NR               | 490       | 37941            | NR               | 620       | 88803            | NR               | 750       | 3908             | NR               | 880       | 2997             | NR               |
| 365       | 2596             | NR               | 495       | 48525            | NR               | 625       | 80578            | NR               | 755       | 3988             | NR               | 885       | 2927             | NR               |
| 370       | 2732             | NR               | 500       | 60609            | NR               | 630       | 73127            | NR               | 760       | 3335             | NR               | 890       | 2649             | NR               |
| 375       | 2894             | NR               | 505       | 72036            | NR               | 635       | 66244            | NR               | 765       | 3438             | NR               | 895       | 2828             | NR               |
| 380       | 2822             | NR               | 510       | 82168            | NR               | 640       | 59440            | NR               | 770       | 3427             | NR               | 900       | 1407             | NR               |
| 385       | 2394             | NR               | 515       | 90898            | NR               | 645       | 52864            | NR               | 775       | 2759             | NR               | 905       | 2224             | NR               |
| 390       | 2370             | NR               | 520       | 97142            | NR               | 650       | 47085            | NR               | 780       | 2340             | NR               | 910       | 2905             | NR               |
| 395       | 2267             | NR               | 525       | 103255           | NR               | 655       | 41789            | NR               | 785       | 2412             | NR               | 915       | 3350             | NR               |
| 400       | 2262             | NR               | 530       | 106697           | NR               | 660       | 37064            | NR               | 790       | 1999             | NR               | 920       | 3114             | NR               |
| 405       | 3000             | NR               | 535       | 110081           | NR               | 665       | 32299            | NR               | 795       | 2054             | NR               | 925       | 2834             | NR               |
| 410       | 5324             | NR               | 540       | 112494           | NR               | 670       | 28142            | NR               | 800       | 2331             | NR               | 930       | 2271             | NR               |
| 415       | 10725            | NR               | 545       | 115513           | NR               | 675       | 24505            | NR               | 805       | 2648             | NR               | 935       | 2228             | NR               |
| 420       | 22128            | NR               | 550       | 117203           | NR               | 680       | 21162            | NR               | 810       | 2485             | NR               | 940       | 2833             | NR               |
| 425       | 44095            | NR               | 555       | 119753           | NR               | 685       | 18400            | NR               | 815       | 2409             | NR               | 945       | 2941             | NR               |
| 430       | 77002            | NR               | 560       | 122602           | NR               | 690       | 16065            | NR               | 820       | 2221             | NR               | 950       | 2323             | NR               |
| 435       | 119881           | NR               | 565       | 124314           | NR               | 695       | 13860            | NR               | 825       | 1562             | NR               | 955       | 1667             | NR               |
| 440       | 164454           | NR               | 570       | 126775           | NR               | 700       | 12177            | NR               | 830       | 2249             | NR               | 960       | 749              | NR               |
| 445       | 179997           | NR               | 575       | 127511           | NR               | 705       | 10757            | NR               | 835       | 2573             | NR               | 965       | 2669             | NR               |
| 450       | 142822           | NR               | 580       | 127577           | NR               | 710       | 9601             | NR               | 840       | 2764             | NR               | 970       | 3968             | NR               |
| 455       | 90008            | NR               | 585       | 126153           | NR               | 715       | 8944             | NR               | 845       | 3109             | NR               | 975       | 3886             | NR               |
| 460       | 60557            | NR               | 590       | 123678           | NR               | 720       | 7947             | NR               | 850       | 2963             | NR               | 980       | 2788             | NR               |
| 465       | 43305            | NR               | 595       | 119774           | NR               | 725       | 7062             | NR               | 855       | 2336             | NR               | 985       | 3496             | NR               |
| 470       | 31089            | NR               | 600       | 115733           | NR               | 730       | 6004             | NR               | 860       | 2118             | NR               | 990       | 2913             | NR               |
| 475       | 26278            | NR               | 605       | 109231           | NR               | 735       | 5594             | NR               | 865       | 3144             | NR               | 995       | 4659             | NR               |
| 480       | 27060            | NR               | 610       | 102408           | NR               | 740       | 5165             | NR               | 870       | 3069             | NR               | 1000      | 1308             | NR               |
| 485       | 30698            | NR               | 615       | 96015            | NR               | 745       | 4687             | NR               | 875       | 3311             | NR               |           |                  |                  |

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**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: 5378.9**

**M/P: 0.71**

| 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       | 2945             | NR               | 490       | 37941            | NR               | 620       | 88803            | NR               | 750       | 3908             | NR               | 880       | 2997             | NR               |
| 365       | 2596             | NR               | 495       | 48525            | NR               | 625       | 80578            | NR               | 755       | 3988             | NR               | 885       | 2927             | NR               |
| 370       | 2732             | NR               | 500       | 60609            | NR               | 630       | 73127            | NR               | 760       | 3335             | NR               | 890       | 2649             | NR               |
| 375       | 2894             | NR               | 505       | 72036            | NR               | 635       | 66244            | NR               | 765       | 3438             | NR               | 895       | 2828             | NR               |
| 380       | 2822             | NR               | 510       | 82168            | NR               | 640       | 59440            | NR               | 770       | 3427             | NR               | 900       | 1407             | NR               |
| 385       | 2394             | NR               | 515       | 90898            | NR               | 645       | 52864            | NR               | 775       | 2759             | NR               | 905       | 2224             | NR               |
| 390       | 2370             | NR               | 520       | 97142            | NR               | 650       | 47085            | NR               | 780       | 2340             | NR               | 910       | 2905             | NR               |
| 395       | 2267             | NR               | 525       | 103255           | NR               | 655       | 41789            | NR               | 785       | 2412             | NR               | 915       | 3350             | NR               |
| 400       | 2262             | NR               | 530       | 106697           | NR               | 660       | 37064            | NR               | 790       | 1999             | NR               | 920       | 3114             | NR               |
| 405       | 3000             | NR               | 535       | 110081           | NR               | 665       | 32299            | NR               | 795       | 2054             | NR               | 925       | 2834             | NR               |
| 410       | 5324             | NR               | 540       | 112494           | NR               | 670       | 28142            | NR               | 800       | 2331             | NR               | 930       | 2271             | NR               |
| 415       | 10725            | NR               | 545       | 115513           | NR               | 675       | 24505            | NR               | 805       | 2648             | NR               | 935       | 2228             | NR               |
| 420       | 22128            | NR               | 550       | 117203           | NR               | 680       | 21162            | NR               | 810       | 2485             | NR               | 940       | 2833             | NR               |
| 425       | 44095            | NR               | 555       | 119753           | NR               | 685       | 18400            | NR               | 815       | 2409             | NR               | 945       | 2941             | NR               |
| 430       | 77002            | NR               | 560       | 122602           | NR               | 690       | 16065            | NR               | 820       | 2221             | NR               | 950       | 2323             | NR               |
| 435       | 119881           | NR               | 565       | 124314           | NR               | 695       | 13860            | NR               | 825       | 1562             | NR               | 955       | 1667             | NR               |
| 440       | 164454           | NR               | 570       | 126775           | NR               | 700       | 12177            | NR               | 830       | 2249             | NR               | 960       | 749              | NR               |
| 445       | 179997           | NR               | 575       | 127511           | NR               | 705       | 10757            | NR               | 835       | 2573             | NR               | 965       | 2669             | NR               |
| 450       | 142822           | NR               | 580       | 127577           | NR               | 710       | 9601             | NR               | 840       | 2764             | NR               | 970       | 3968             | NR               |
| 455       | 90008            | NR               | 585       | 126153           | NR               | 715       | 8944             | NR               | 845       | 3109             | NR               | 975       | 3886             | NR               |
| 460       | 60557            | NR               | 590       | 123678           | NR               | 720       | 7947             | NR               | 850       | 2963             | NR               | 980       | 2788             | NR               |
| 465       | 43305            | NR               | 595       | 119774           | NR               | 725       | 7062             | NR               | 855       | 2336             | NR               | 985       | 3496             | NR               |
| 470       | 31089            | NR               | 600       | 115733           | NR               | 730       | 6004             | NR               | 860       | 2118             | NR               | 990       | 2913             | NR               |
| 475       | 26278            | NR               | 605       | 109231           | NR               | 735       | 5594             | NR               | 865       | 3144             | NR               | 995       | 4659             | NR               |
| 480       | 27060            | NR               | 610       | 102408           | NR               | 740       | 5165             | NR               | 870       | 3069             | NR               | 1000      | 1308             | NR               |
| 485       | 30698            | NR               | 615       | 96015            | NR               | 745       | 4687             | NR               | 875       | 3311             | NR               |           |                  |                  |

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**TM-30-18**

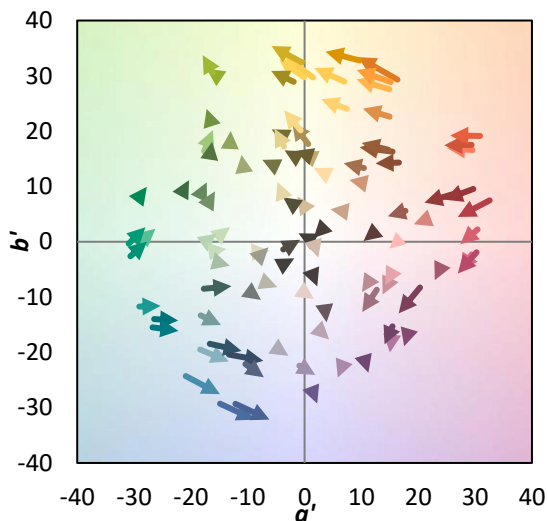
**Summary**

$R_f = 74.9$   
 $R_g = 96.3$   
 CIE  $R_a = 73.5$   
 $R_g = -28.4$

**Spectral Power Distribution Comparison**



**Color Vector Graphics**

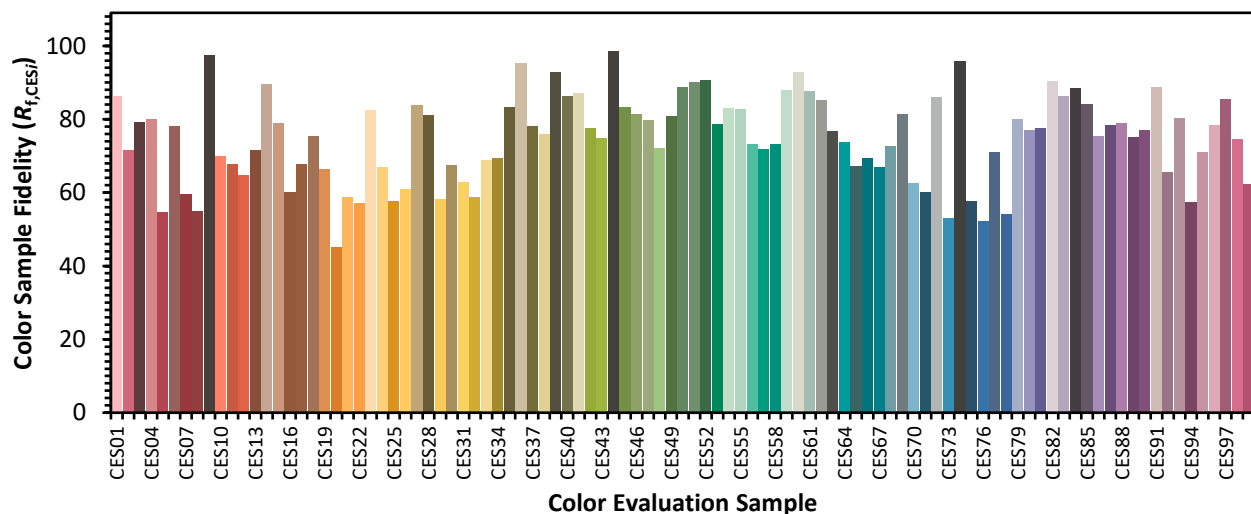


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**Individual Sample Fidelity Index ( $R_{f,i}$ )**

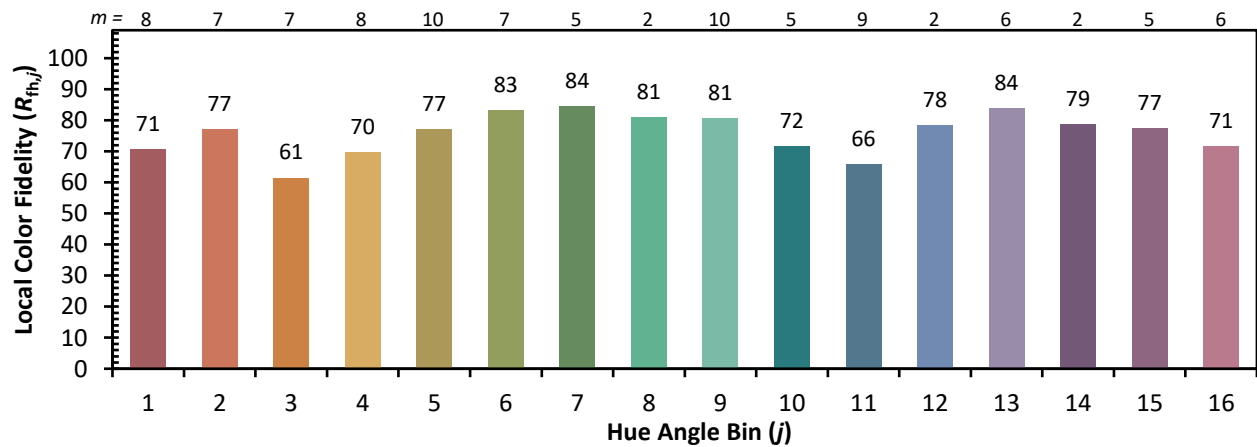
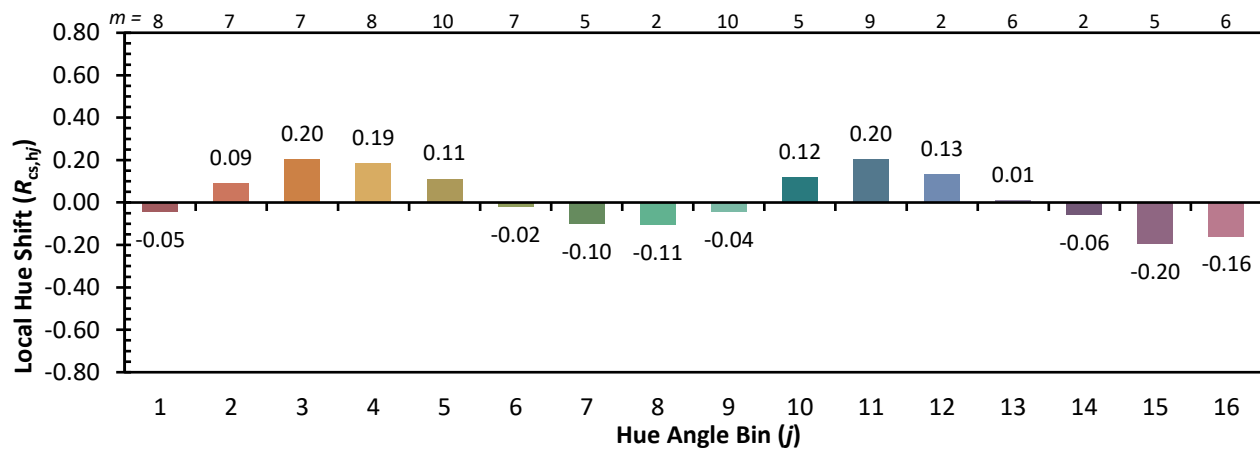
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 61 | CES51 = 90 | CES76 = 52 |
| CES02 = 60 | CES27 = 84 | CES52 = 91 | CES77 = 71 |
| CES03 = 30 | CES28 = 81 | CES53 = 79 | CES78 = 54 |
| CES04 = 69 | CES29 = 58 | CES54 = 83 | CES79 = 80 |
| CES05 = 46 | CES30 = 67 | CES55 = 83 | CES80 = 77 |
| CES06 = 50 | CES31 = 63 | CES56 = 73 | CES81 = 77 |
| CES07 = 39 | CES32 = 59 | CES57 = 72 | CES82 = 90 |
| CES08 = 38 | CES33 = 69 | CES58 = 73 | CES83 = 86 |
| CES09 = 29 | CES34 = 69 | CES59 = 88 | CES84 = 88 |
| CES10 = 73 | CES35 = 83 | CES60 = 93 | CES85 = 84 |
| CES11 = 56 | CES36 = 95 | CES61 = 88 | CES86 = 75 |
| CES12 = 61 | CES37 = 78 | CES62 = 85 | CES87 = 78 |
| CES13 = 41 | CES38 = 76 | CES63 = 77 | CES88 = 79 |
| CES14 = 74 | CES39 = 93 | CES64 = 74 | CES89 = 75 |
| CES15 = 70 | CES40 = 86 | CES65 = 67 | CES90 = 77 |
| CES16 = 46 | CES41 = 87 | CES66 = 69 | CES91 = 89 |
| CES17 = 49 | CES42 = 78 | CES67 = 67 | CES92 = 66 |
| CES18 = 55 | CES43 = 75 | CES68 = 73 | CES93 = 80 |
| CES19 = 71 | CES44 = 99 | CES69 = 81 | CES94 = 57 |
| CES20 = 64 | CES45 = 83 | CES70 = 63 | CES95 = 71 |
| CES21 = 85 | CES46 = 81 | CES71 = 60 | CES96 = 78 |
| CES22 = 77 | CES47 = 80 | CES72 = 86 | CES97 = 85 |
| CES23 = 91 | CES48 = 72 | CES73 = 53 | CES98 = 75 |
| CES24 = 90 | CES49 = 81 | CES74 = 96 | CES99 = 62 |
| CES25 = 71 | CES50 = 89 | CES75 = 58 |            |



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Color Rendition by Hue-Angle Bin



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**Measure Comparisons**



(END OF REPORT)