

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: P323360

Luminaire Tested: **GLEON-SA6B-830-U-SL2-HSS**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P323360  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-21)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA6B-830-U-SL2-HSS  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(6) 80 CRI, 3000K, 800mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE II SPILL  
LIGHT ELIMINATOR OPTICS WITH HOUSE SIDE SHIELD  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 22497 lumens  
Efficiency: N/A  
Efficacy: 90.3 lumens/watt  
Luminous Opening: Rectangular (W 1.5' x L: 1' x H: 0')  
IES Classification: Type III - Medium  
BUG Rating: B2 - U0 - G4

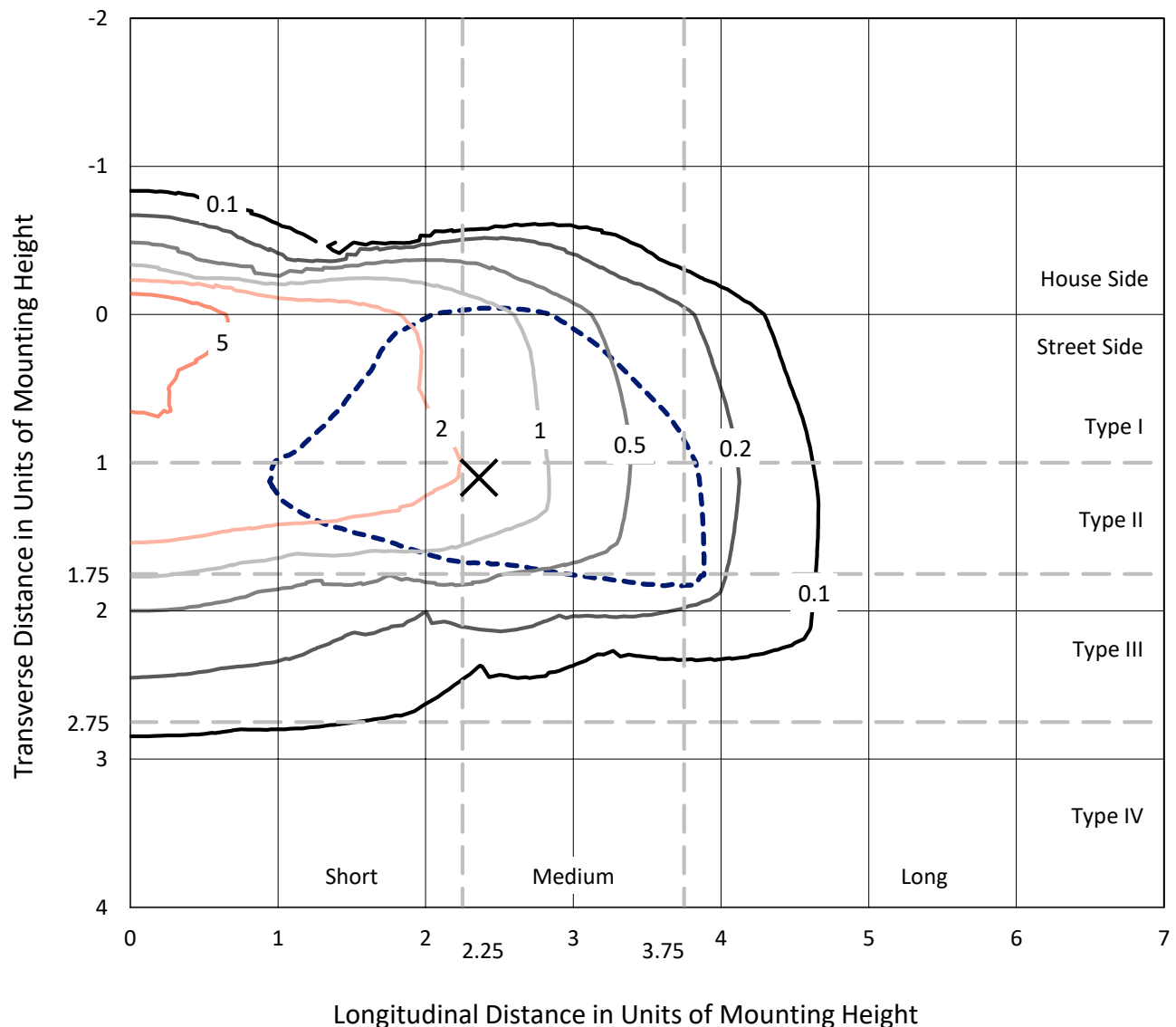
Input Watts (W): 249  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



REPORT NUMBER: P323360  
 CATALOG NUMBER: GLEON-SA6B-830-U-SL2-HSS

## Iso-Footcandle Lines of Horizontal Illumination

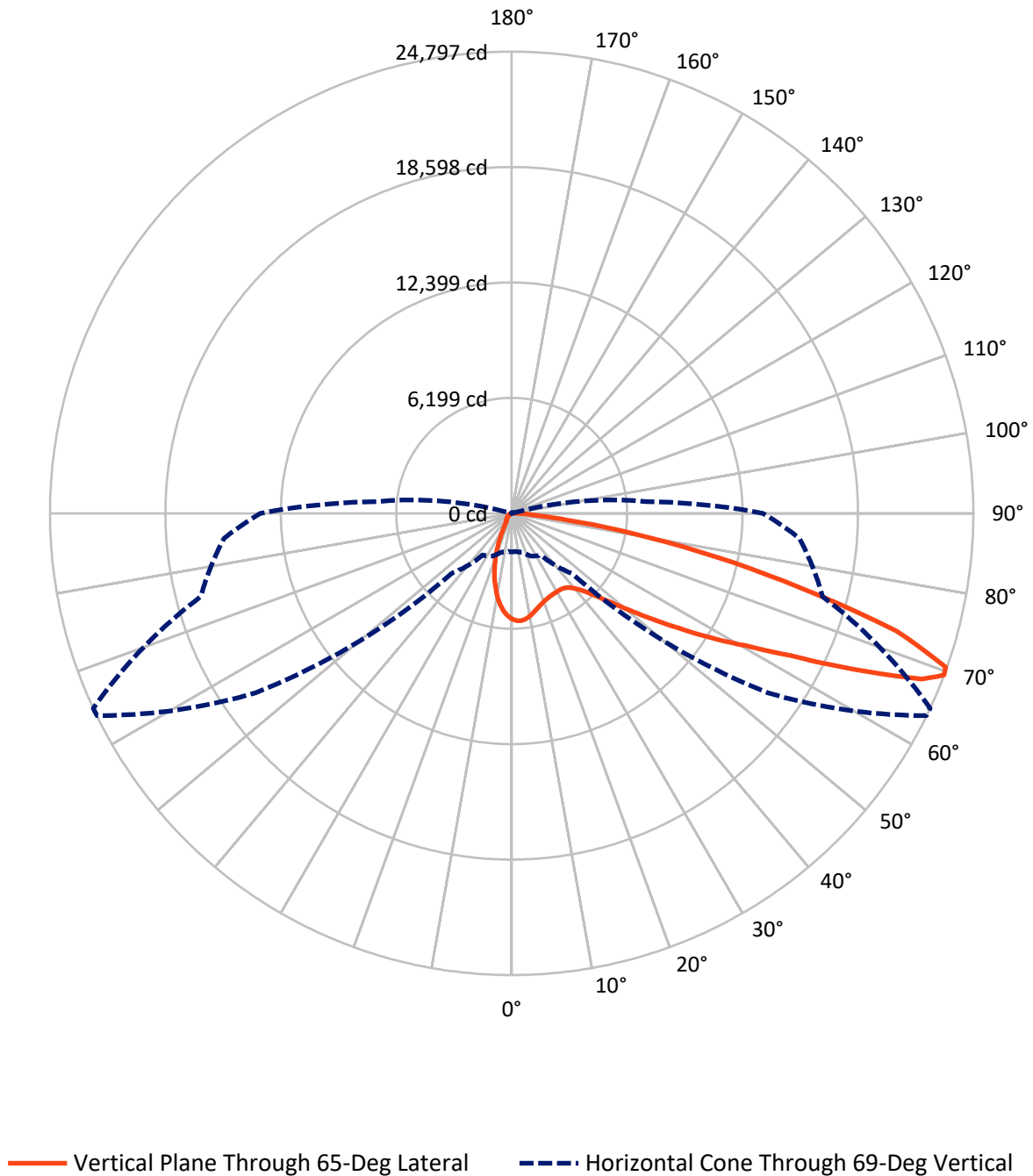
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 9.1 fc  
 Type III - Medium - N/A

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## Luminous Intensity Polar Plot



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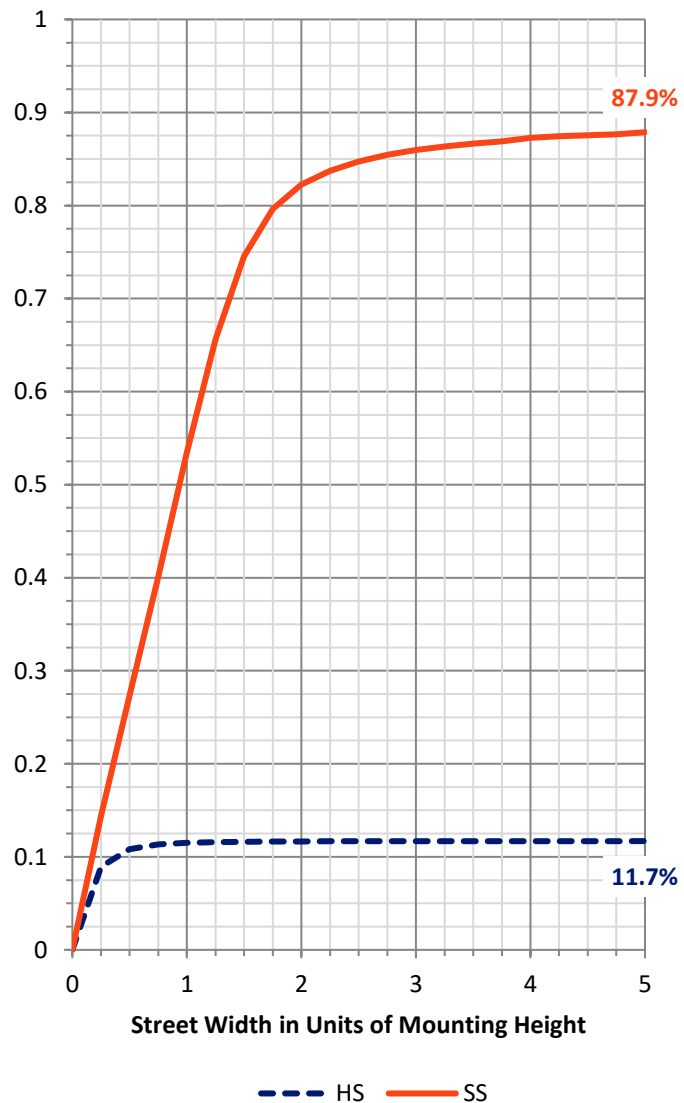
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 2651.9   | 0.0    | 2651.9  |
|                    | % Fixture | 11.8     | 0.0    | 11.8    |
| <b>Street Side</b> | Lumens    | 19845.1  | 0.0    | 19845.1 |
|                    | % Fixture | 88.2     | 0.0    | 88.2    |
| <b>Total</b>       | Lumens    | 22497.0  | 0.0    | 22497.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 475.4   | 2.1       |
| 10°-20°   | 1040.6  | 4.6       |
| 20°-30°   | 1441.3  | 6.4       |
| 30°-40°   | 2009.7  | 8.9       |
| 40°-50°   | 3123.7  | 13.9      |
| 50°-60°   | 5014.7  | 22.3      |
| 60°-70°   | 5672.5  | 25.2      |
| 70°-80°   | 3331.5  | 14.8      |
| 80°-90°   | 387.5   | 1.7       |
| 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°    | 22497.0 | 100.0     |
| 0°-180°   | 22497.0 | 100.0     |

**Coefficient of Utilization**



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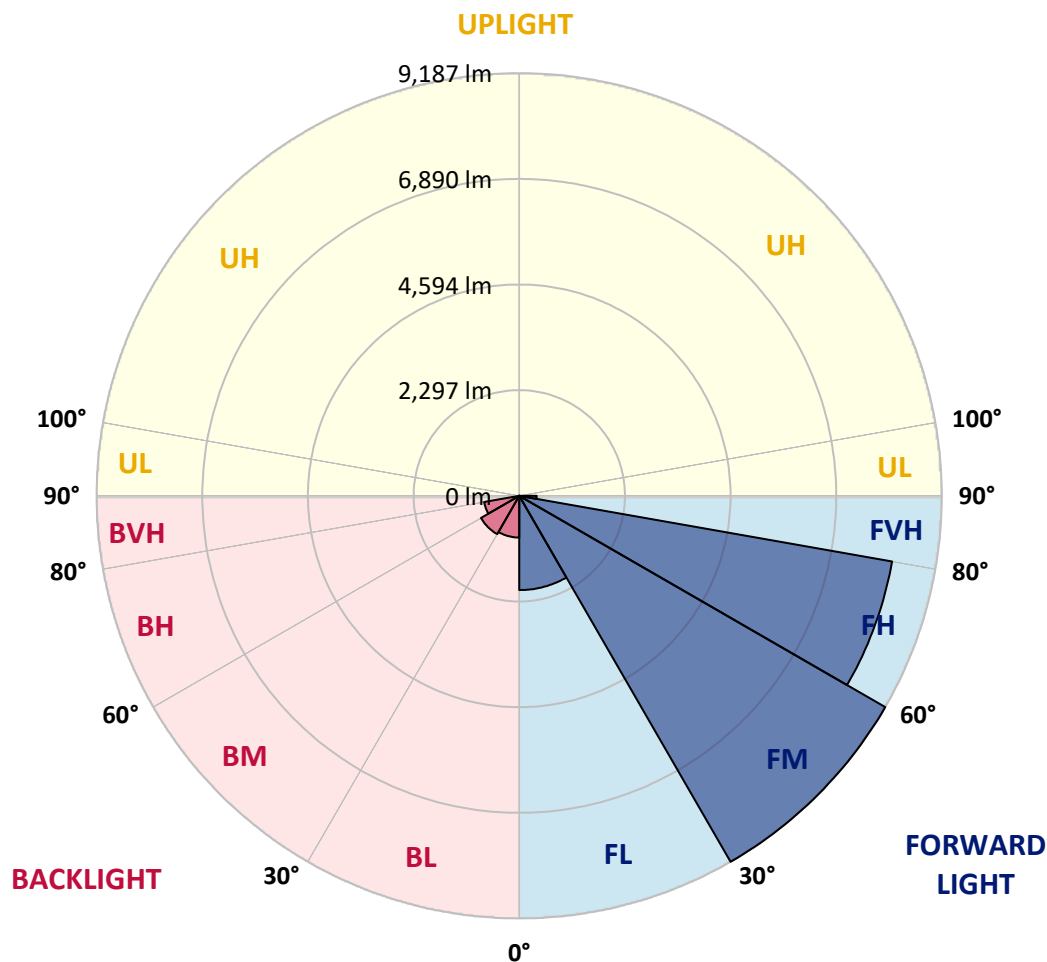
CATALOG NUMBER: GLEON-SA6B-830-U-SL2-HSS

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |          |
|------|-------------|--------|-----------|-------------------------|------|----------|
|      |             |        |           | B                       | U    | G        |
| FL   | (0°-30°)    | 2050.0 | 9.1       |                         |      |          |
| FM   | (30°-60°)   | 9187.1 | 40.8      |                         |      |          |
| FH   | (60°-80°)   | 8229.2 | 36.6      |                         |      | G4/12000 |
| FVH  | (80°-90°)   | 378.8  | 1.7       |                         |      | G3/500   |
| BL   | (0°-30°)    | 907.4  | 4.0       | B2/1000                 |      |          |
| BM   | (30°-60°)   | 961.0  | 4.3       | B1/1000                 |      |          |
| BH   | (60°-80°)   | 774.8  | 3.4       | B2/1000                 |      | G2/1000  |
| BVH  | (80°-90°)   | 8.7    | 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-G4**

Type III Medium





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°     | 45°     | 55°     | 64°     | 65°     | 75°     | 85°     |
|-------|--------|--------|--------|--------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 5685.0 | 5685.0 | 5685.0 | 5685.0 | 5685.0  | 5685.0  | 5685.0  | 5685.0  | 5685.0  | 5685.0  | 5685.0  |
| 2.5°  | 5735.5 | 5721.2 | 5732.6 | 5757.4 | 5769.8  | 5769.8  | 5779.3  | 5767.9  | 5771.7  | 5744.1  | 5704.1  |
| 5°    | 5376.6 | 5354.7 | 5386.1 | 5455.6 | 5541.3  | 5614.6  | 5723.1  | 5780.2  | 5785.9  | 5786.9  | 5740.2  |
| 7.5°  | 4990.1 | 4970.1 | 5016.8 | 5098.6 | 5209.1  | 5345.2  | 5534.6  | 5700.3  | 5709.8  | 5799.3  | 5765.0  |
| 10°   | 4676.0 | 4661.7 | 4715.9 | 4803.5 | 4933.0  | 5085.3  | 5317.6  | 5548.0  | 5575.6  | 5773.6  | 5761.2  |
| 12.5° | 4426.6 | 4415.1 | 4466.5 | 4567.4 | 4699.8  | 4868.3  | 5111.0  | 5378.5  | 5415.6  | 5715.5  | 5742.1  |
| 15°   | 4244.7 | 4242.8 | 4285.7 | 4382.8 | 4529.4  | 4686.4  | 4934.9  | 5221.4  | 5264.3  | 5652.7  | 5739.3  |
| 17.5° | 4149.5 | 4152.4 | 4183.8 | 4266.6 | 4392.3  | 4548.4  | 4786.4  | 5089.1  | 5135.8  | 5596.5  | 5753.6  |
| 20°   | 4140.0 | 4142.9 | 4160.0 | 4206.7 | 4308.5  | 4446.5  | 4665.5  | 4977.7  | 5026.3  | 5554.6  | 5776.4  |
| 22.5° | 4223.8 | 4221.9 | 4226.6 | 4221.9 | 4279.0  | 4383.7  | 4585.5  | 4892.1  | 4948.2  | 5527.0  | 5794.5  |
| 25°   | 4384.7 | 4381.8 | 4379.9 | 4344.7 | 4306.6  | 4362.8  | 4552.2  | 4843.5  | 4896.8  | 5507.0  | 5805.0  |
| 27.5° | 4608.4 | 4606.5 | 4603.6 | 4545.5 | 4431.3  | 4396.1  | 4556.0  | 4825.4  | 4870.2  | 5490.8  | 5803.1  |
| 30°   | 4902.5 | 4915.9 | 4912.0 | 4831.1 | 4653.1  | 4498.0  | 4596.0  | 4815.9  | 4854.9  | 5459.4  | 5783.1  |
| 32.5° | 5248.1 | 5274.7 | 5295.7 | 5209.1 | 4986.3  | 4699.8  | 4688.3  | 4826.4  | 4854.9  | 5435.6  | 5746.9  |
| 35°   | 5607.0 | 5641.2 | 5718.3 | 5687.9 | 5394.7  | 5003.4  | 4847.3  | 4889.2  | 4913.0  | 5448.9  | 5729.8  |
| 37.5° | 5960.1 | 6001.1 | 6168.6 | 6257.2 | 5929.7  | 5405.2  | 5094.8  | 5044.4  | 5056.7  | 5529.9  | 5748.8  |
| 40°   | 6370.4 | 6432.3 | 6686.5 | 6829.3 | 6568.4  | 5943.0  | 5465.1  | 5310.9  | 5315.7  | 5707.9  | 5837.3  |
| 42.5° | 6909.2 | 6973.0 | 7248.1 | 7471.8 | 7288.1  | 6622.7  | 5967.8  | 5718.3  | 5713.6  | 6041.1  | 6045.8  |
| 45°   | 7566.1 | 7632.7 | 7917.3 | 8165.8 | 8083.0  | 7428.0  | 6611.3  | 6313.3  | 6307.6  | 6566.5  | 6440.9  |
| 47.5° | 8310.5 | 8376.2 | 8630.4 | 8886.4 | 8975.9  | 8368.6  | 7430.9  | 7125.3  | 7112.0  | 7296.7  | 7051.1  |
| 50°   | 8949.3 | 8992.1 | 9226.3 | 9570.9 | 9974.5  | 9524.2  | 8450.4  | 8156.3  | 8142.0  | 8266.7  | 7946.9  |
| 52.5° | 9181.5 | 9206.3 | 9444.3 | 9926.9 | 10934.1 | 11089.2 | 9789.8  | 9411.0  | 9400.5  | 9454.7  | 9139.6  |
| 55°   | 8711.3 | 8756.0 | 9048.3 | 9764.1 | 11453.8 | 12858.0 | 11480.5 | 10964.5 | 10885.5 | 10768.4 | 10386.7 |
| 57.5° | 7430.0 | 7501.3 | 7815.5 | 8767.4 | 11211.1 | 14261.1 | 13965.1 | 12721.8 | 12605.7 | 11889.8 | 11400.5 |
| 60°   | 5567.0 | 5654.6 | 5915.4 | 6942.6 | 9915.5  | 14760.9 | 16680.0 | 14680.0 | 14418.2 | 12782.8 | 12332.5 |
| 62.5° | 3820.2 | 3864.0 | 4041.0 | 4710.2 | 7302.4  | 13942.2 | 18951.4 | 17302.6 | 16824.7 | 13753.7 | 13340.6 |
| 65°   | 2917.7 | 2933.0 | 3005.3 | 3235.7 | 4348.5  | 11325.3 | 19854.8 | 20762.9 | 20185.1 | 14915.1 | 14386.8 |
| 67.5° | 2351.3 | 2338.9 | 2438.9 | 2768.3 | 2912.0  | 6909.2  | 18801.0 | 24036.7 | 23766.3 | 16467.7 | 15439.6 |
| 69°   | 2073.3 | 2056.2 | 2158.1 | 2540.7 | 2734.9  | 4567.4  | 16807.6 | 24780.1 | 24797.3 | 17287.4 | 15512.0 |
| 70°   | 1865.8 | 1877.2 | 1978.1 | 2405.6 | 2675.0  | 3585.0  | 14903.7 | 24590.7 | 24725.9 | 17593.9 | 15077.9 |
| 72.5° | 1246.1 | 1276.6 | 1479.3 | 1997.2 | 2572.2  | 2713.1  | 8998.8  | 21101.8 | 21621.6 | 16903.7 | 12936.0 |
| 75°   | 702.5  | 725.4  | 966.2  | 1506.0 | 2423.7  | 2583.6  | 4753.1  | 15546.3 | 16048.9 | 14135.5 | 9975.5  |
| 77.5° | 344.6  | 357.0  | 546.4  | 971.9  | 2026.7  | 2461.7  | 2695.9  | 10560.0 | 11134.0 | 9226.3  | 5642.2  |
| 80°   | 145.6  | 152.3  | 273.2  | 599.7  | 1448.9  | 2349.4  | 2001.9  | 6498.9  | 6570.3  | 3614.5  | 1503.1  |
| 82.5° | 56.2   | 58.1   | 115.2  | 374.1  | 920.5   | 1831.5  | 1674.5  | 3081.5  | 3007.2  | 680.6   | 342.7   |
| 85°   | 6.7    | 7.6    | 41.9   | 224.7  | 512.1   | 942.4   | 1360.3  | 1328.0  | 1229.0  | 135.2   | 176.1   |
| 87.5° | 0.0    | 0.0    | 2.9    | 68.5   | 152.3   | 441.7   | 707.3   | 551.2   | 496.9   | 43.8    | 91.4    |
| 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: P323360

CATALOG NUMBER: GLEON-SA6B-830-U-SL2-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°     | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 5685.0  | 5685.0 | 5685.0 | 5685.0 | 5685.0 | 5685.0 | 5685.0 | 5685.0 | 5685.0 | 5685.0 | 5685.0 |
| 2.5°  | 5670.8  | 5661.2 | 5609.8 | 5535.6 | 5465.1 | 5377.6 | 5293.8 | 5243.3 | 5203.3 | 5176.7 | 5208.1 |
| 5°    | 5686.0  | 5644.1 | 5488.0 | 5288.1 | 5092.0 | 4871.1 | 4665.5 | 4491.3 | 4422.7 | 4346.6 | 4380.9 |
| 7.5°  | 5681.2  | 5602.2 | 5321.4 | 4965.4 | 4605.5 | 4233.3 | 3881.1 | 3609.8 | 3468.9 | 3330.9 | 3366.1 |
| 10°   | 5657.4  | 5524.2 | 5098.6 | 4571.3 | 4032.5 | 3497.5 | 2997.7 | 2617.9 | 2405.6 | 2213.3 | 2240.9 |
| 12.5° | 5605.1  | 5419.4 | 4835.9 | 4120.0 | 3399.4 | 2694.0 | 2108.6 | 1622.1 | 1361.3 | 1246.1 | 1260.4 |
| 15°   | 5573.7  | 5317.6 | 4557.9 | 3663.1 | 2723.5 | 1876.3 | 1288.9 | 958.6  | 839.6  | 801.5  | 806.3  |
| 17.5° | 5558.4  | 5219.5 | 4270.4 | 3140.5 | 2032.4 | 1194.7 | 833.0  | 734.9  | 709.2  | 702.5  | 704.4  |
| 20°   | 5543.2  | 5120.5 | 3974.4 | 2623.6 | 1400.3 | 803.4  | 684.5  | 655.9  | 646.4  | 637.8  | 639.7  |
| 22.5° | 5517.5  | 5025.3 | 3656.4 | 2100.0 | 944.3  | 652.1  | 616.9  | 589.3  | 569.3  | 558.8  | 560.7  |
| 25°   | 5486.1  | 4925.4 | 3331.8 | 1564.0 | 689.2  | 581.6  | 548.3  | 509.3  | 485.5  | 466.5  | 467.4  |
| 27.5° | 5435.6  | 4802.6 | 2996.7 | 1138.5 | 578.8  | 520.7  | 476.0  | 433.1  | 393.2  | 371.3  | 371.3  |
| 30°   | 5365.2  | 4663.6 | 2624.5 | 814.9  | 518.8  | 460.7  | 406.5  | 353.2  | 310.3  | 290.3  | 288.4  |
| 32.5° | 5287.1  | 4518.9 | 2248.5 | 617.8  | 471.2  | 404.6  | 342.7  | 286.5  | 248.5  | 232.3  | 231.3  |
| 35°   | 5220.5  | 4362.8 | 1873.4 | 517.9  | 423.6  | 350.3  | 282.7  | 235.1  | 204.7  | 191.3  | 190.4  |
| 37.5° | 5177.6  | 4206.7 | 1507.9 | 462.6  | 380.8  | 299.9  | 237.0  | 194.2  | 172.3  | 161.8  | 160.9  |
| 40°   | 5171.0  | 4090.5 | 1173.8 | 420.8  | 340.8  | 255.1  | 198.0  | 164.7  | 144.7  | 133.3  | 132.3  |
| 42.5° | 5257.6  | 4023.9 | 900.5  | 385.5  | 299.9  | 216.1  | 168.5  | 140.9  | 119.9  | 108.5  | 107.6  |
| 45°   | 5485.1  | 4044.8 | 693.0  | 354.1  | 258.9  | 182.8  | 142.8  | 117.1  | 98.1   | 89.5   | 87.6   |
| 47.5° | 5900.2  | 4189.5 | 551.2  | 322.7  | 219.9  | 155.2  | 121.8  | 97.1   | 80.9   | 72.3   | 71.4   |
| 50°   | 6638.9  | 4529.4 | 460.7  | 288.4  | 183.7  | 132.3  | 100.9  | 79.0   | 65.7   | 58.1   | 57.1   |
| 52.5° | 7619.4  | 5134.8 | 411.2  | 255.1  | 152.3  | 112.3  | 82.8   | 62.8   | 51.4   | 45.7   | 44.7   |
| 55°   | 8700.8  | 5867.8 | 378.9  | 218.9  | 124.7  | 93.3   | 65.7   | 49.5   | 40.0   | 35.2   | 33.3   |
| 57.5° | 9756.5  | 6502.8 | 348.4  | 183.7  | 103.8  | 76.2   | 52.4   | 39.0   | 31.4   | 26.7   | 25.7   |
| 60°   | 10726.5 | 7086.3 | 313.2  | 147.6  | 84.7   | 60.0   | 40.9   | 30.5   | 24.8   | 20.0   | 20.0   |
| 62.5° | 11765.1 | 7537.5 | 264.6  | 115.2  | 69.5   | 45.7   | 33.3   | 27.6   | 20.0   | 17.1   | 16.2   |
| 65°   | 12865.6 | 7872.6 | 207.5  | 89.5   | 54.3   | 34.3   | 27.6   | 28.6   | 16.2   | 12.4   | 11.4   |
| 67.5° | 13678.5 | 7806.0 | 153.3  | 70.4   | 41.9   | 26.7   | 26.7   | 30.5   | 14.3   | 9.5    | 8.6    |
| 69°   | 13499.6 | 7264.3 | 128.5  | 60.9   | 36.2   | 22.8   | 24.8   | 30.5   | 13.3   | 8.6    | 7.6    |
| 70°   | 12980.8 | 6664.6 | 113.3  | 54.3   | 32.4   | 20.9   | 23.8   | 29.5   | 12.4   | 8.6    | 7.6    |
| 72.5° | 10810.3 | 5019.6 | 88.5   | 40.9   | 25.7   | 17.1   | 20.0   | 25.7   | 12.4   | 8.6    | 6.7    |
| 75°   | 8131.5  | 3212.8 | 67.6   | 29.5   | 19.0   | 13.3   | 15.2   | 19.0   | 12.4   | 7.6    | 6.7    |
| 77.5° | 4424.7  | 1158.5 | 48.5   | 20.0   | 13.3   | 10.5   | 10.5   | 14.3   | 11.4   | 5.7    | 3.8    |
| 80°   | 1137.6  | 291.3  | 30.5   | 13.3   | 10.5   | 7.6    | 6.7    | 9.5    | 6.7    | 1.0    | 0.0    |
| 82.5° | 280.8   | 65.7   | 16.2   | 9.5    | 7.6    | 2.9    | 2.9    | 4.8    | 2.9    | 0.0    | 0.0    |
| 85°   | 154.2   | 32.4   | 10.5   | 6.7    | 3.8    | 0.0    | 0.0    | 1.0    | 0.0    | 0.0    | 0.0    |
| 87.5° | 79.0    | 9.5    | 2.9    | 1.9    | 1.0    | 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-79-2019: Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Report Prepared for

Cooper Lighting Solutions

MCGRAW EDISON

Report Number: SP1-2408-195-9

Test Date: 08/07/2024

Luminaire Tested: GALN-SB1A-830-U-5WQ

Data in this report applies to families of products including GALN-SB1A-830-U-5WQ.

### Test Information

Test Method: LM-79-2019  
 Report Number: SP1-2408-195-9  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry:  $4\pi$   
 Issue Date: 08/07/2024  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: MCGRAW EDISON  
 Catalog Number: **GALN-SB1A-830-U-5WQ**  
 Description: GALLEON AREA AND ROADWAY LUMINAIRE. (1) 80 CRI, 3000K, 350MA HIGH DENSITY LIGHTSQUARE WITH 26 LEDS AND TYPE V WIDE OPTICS

### Spectral Parameters

CCT (K): 3050  
 CIE u': 0.2476  
 CIE v': 0.5251  
 Duv: 0.0034  
 CIE x: 0.4383  
 CIE y: 0.4131  
 CIE z: 0.1487  
 Peak Wavelength (nm): 603  
 Dominant Wavelength (nm): 581  
 Purity: 55.55201  
 Rf: 81.5  
 Rg: 99.2

CRI (Ra): 81.0  
 R1: 79.6  
 R2: 85.6  
 R3: 92.0  
 R4: 82.6  
 R5: 78.9  
 R6: 81.7  
 R7: 85.2  
 R8: 62.0  
 R9: 7.1  
 R10: 67.0  
 R11: 82.7  
 R12: 63.2  
 R13: 80.3  
 R14: 95.0  
 R15: 71.7



### Test Conditions

Stabilization Time: 20M  
 Operation Time: 1H 20M  
 Sphere Temperature (°C): 24.2

REPORT NUMBER: SP1-2408-195-9

| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | IN0058                | 6/18/2024        | 12/18/2024           |
| Power Meter                    | INXT2011004           | 2/8/2024         | 2/8/2025             |
| AC Power Source                | IN0063                | 10/24/2023       | 10/24/2024           |
| DC Power Source                | IN0208                | 10/24/2023       | 10/24/2024           |
| Sphere Thermometer             | IN0085                | 10/24/2023       | 10/24/2024           |
| Room Thermometer               | IN0046                | 10/24/2023       | 10/24/2024           |

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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 3000K 4-step quadrangle

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### Photopic Flux vs. Wavelength

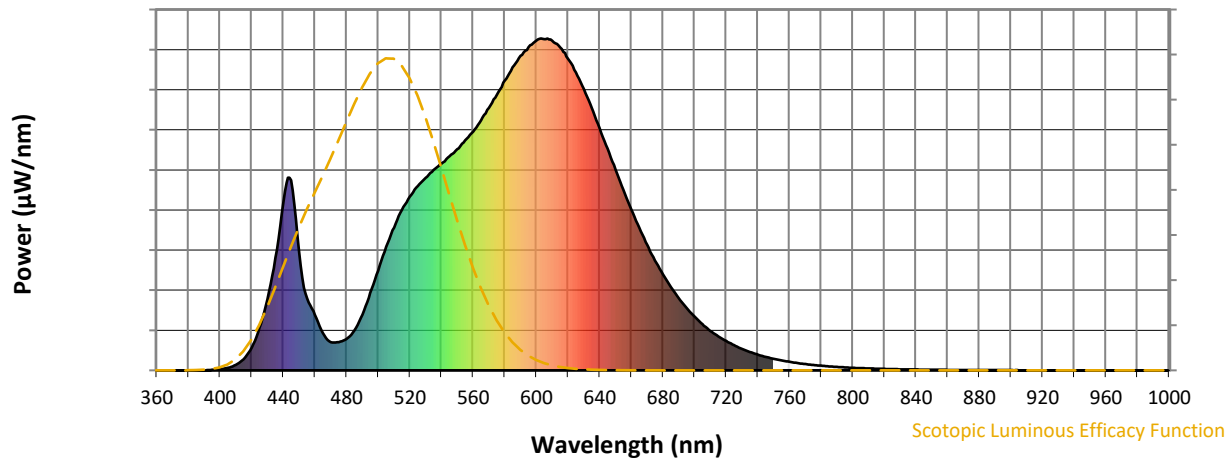


### Photopic Lumens: NR

| $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) |
|-------------------|----------------------------------------|--------------------------------|-------------------|----------------------------------------|--------------------------------|-------------------|----------------------------------------|--------------------------------|-------------------|----------------------------------------|--------------------------------|-------------------|----------------------------------------|--------------------------------|
| 360               | 0                                      | NR                             | 490               | 168                                    | NR                             | 620               | 940                                    | NR                             | 750               | 35                                     | NR                             | 880               | 1                                      | NR                             |
| 365               | 0                                      | NR                             | 495               | 233                                    | NR                             | 625               | 897                                    | NR                             | 755               | 30                                     | NR                             | 885               | 1                                      | NR                             |
| 370               | 0                                      | NR                             | 500               | 300                                    | NR                             | 630               | 847                                    | NR                             | 760               | 26                                     | NR                             | 890               | 1                                      | NR                             |
| 375               | 0                                      | NR                             | 505               | 372                                    | NR                             | 635               | 790                                    | NR                             | 765               | 22                                     | NR                             | 895               | 1                                      | NR                             |
| 380               | 0                                      | NR                             | 510               | 430                                    | NR                             | 640               | 730                                    | NR                             | 770               | 19                                     | NR                             | 900               | 1                                      | NR                             |
| 385               | 0                                      | NR                             | 515               | 483                                    | NR                             | 645               | 668                                    | NR                             | 775               | 16                                     | NR                             | 905               | 1                                      | NR                             |
| 390               | 0                                      | NR                             | 520               | 524                                    | NR                             | 650               | 605                                    | NR                             | 780               | 14                                     | NR                             | 910               | 0                                      | NR                             |
| 395               | 2                                      | NR                             | 525               | 555                                    | NR                             | 655               | 545                                    | NR                             | 785               | 12                                     | NR                             | 915               | 0                                      | NR                             |
| 400               | 4                                      | NR                             | 530               | 581                                    | NR                             | 660               | 485                                    | NR                             | 790               | 10                                     | NR                             | 920               | 0                                      | NR                             |
| 405               | 7                                      | NR                             | 535               | 604                                    | NR                             | 665               | 430                                    | NR                             | 795               | 9                                      | NR                             | 925               | 0                                      | NR                             |
| 410               | 17                                     | NR                             | 540               | 623                                    | NR                             | 670               | 378                                    | NR                             | 800               | 8                                      | NR                             | 930               | 0                                      | NR                             |
| 415               | 34                                     | NR                             | 545               | 645                                    | NR                             | 675               | 331                                    | NR                             | 805               | 7                                      | NR                             | 935               | 0                                      | NR                             |
| 420               | 68                                     | NR                             | 550               | 667                                    | NR                             | 680               | 290                                    | NR                             | 810               | 6                                      | NR                             | 940               | 0                                      | NR                             |
| 425               | 128                                    | NR                             | 555               | 693                                    | NR                             | 685               | 251                                    | NR                             | 815               | 5                                      | NR                             | 945               | 0                                      | NR                             |
| 430               | 214                                    | NR                             | 560               | 719                                    | NR                             | 690               | 218                                    | NR                             | 820               | 4                                      | NR                             | 950               | 0                                      | NR                             |
| 435               | 339                                    | NR                             | 565               | 754                                    | NR                             | 695               | 188                                    | NR                             | 825               | 4                                      | NR                             | 955               | 0                                      | NR                             |
| 440               | 507                                    | NR                             | 570               | 791                                    | NR                             | 700               | 162                                    | NR                             | 830               | 3                                      | NR                             | 960               | 0                                      | NR                             |
| 445               | 573                                    | NR                             | 575               | 830                                    | NR                             | 705               | 139                                    | NR                             | 835               | 3                                      | NR                             | 965               | 0                                      | NR                             |
| 450               | 356                                    | NR                             | 580               | 873                                    | NR                             | 710               | 119                                    | NR                             | 840               | 3                                      | NR                             | 970               | 0                                      | NR                             |
| 455               | 217                                    | NR                             | 585               | 913                                    | NR                             | 715               | 102                                    | NR                             | 845               | 2                                      | NR                             | 975               | 0                                      | NR                             |
| 460               | 168                                    | NR                             | 590               | 948                                    | NR                             | 720               | 88                                     | NR                             | 850               | 2                                      | NR                             | 980               | 0                                      | NR                             |
| 465               | 113                                    | NR                             | 595               | 974                                    | NR                             | 725               | 76                                     | NR                             | 855               | 2                                      | NR                             | 985               | 0                                      | NR                             |
| 470               | 85                                     | NR                             | 600               | 994                                    | NR                             | 730               | 65                                     | NR                             | 860               | 1                                      | NR                             | 990               | 0                                      | NR                             |
| 475               | 85                                     | NR                             | 605               | 998                                    | NR                             | 735               | 55                                     | NR                             | 865               | 1                                      | NR                             | 995               | 0                                      | NR                             |
| 480               | 94                                     | NR                             | 610               | 994                                    | NR                             | 740               | 47                                     | NR                             | 870               | 1                                      | NR                             | 1000              | 0                                      | NR                             |
| 485               | 120                                    | NR                             | 615               | 973                                    | NR                             | 745               | 41                                     | NR                             | 875               | 1                                      | NR                             |                   |                                        |                                |

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### Scotopic Flux vs. Wavelength



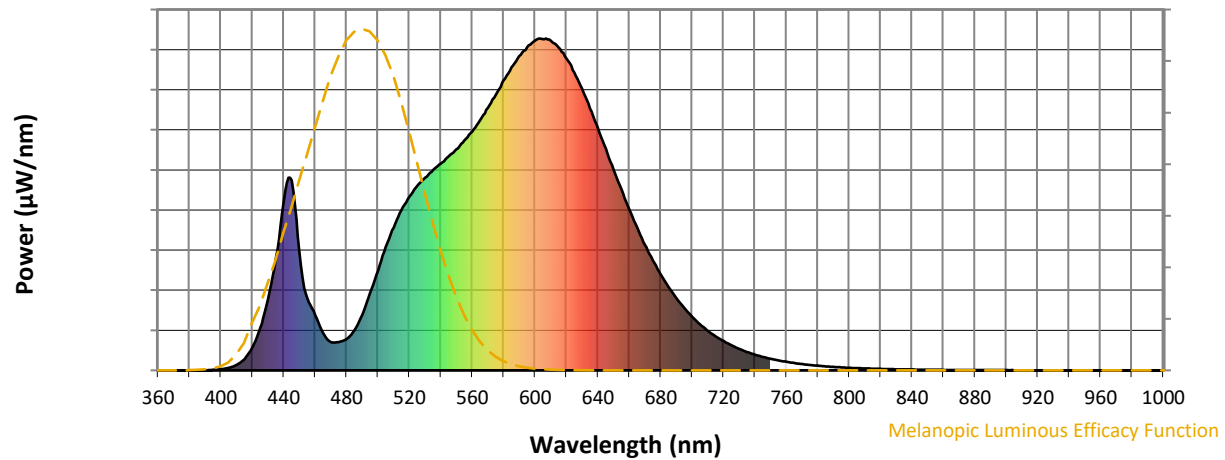
Scotopic Lumens: NR

S/P: 1.27

| λ (nm) | Power W <sup>^</sup> /nm | Lumens (Φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (Φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (Φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (Φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (Φ/nm) |
|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|
| 360    | 0                        | NR            | 490    | 168                      | NR            | 620    | 940                      | NR            | 750    | 35                       | NR            | 880    | 1                        | NR            |
| 365    | 0                        | NR            | 495    | 233                      | NR            | 625    | 897                      | NR            | 755    | 30                       | NR            | 885    | 1                        | NR            |
| 370    | 0                        | NR            | 500    | 300                      | NR            | 630    | 847                      | NR            | 760    | 26                       | NR            | 890    | 1                        | NR            |
| 375    | 0                        | NR            | 505    | 372                      | NR            | 635    | 790                      | NR            | 765    | 22                       | NR            | 895    | 1                        | NR            |
| 380    | 0                        | NR            | 510    | 430                      | NR            | 640    | 730                      | NR            | 770    | 19                       | NR            | 900    | 1                        | NR            |
| 385    | 0                        | NR            | 515    | 483                      | NR            | 645    | 668                      | NR            | 775    | 16                       | NR            | 905    | 1                        | NR            |
| 390    | 0                        | NR            | 520    | 524                      | NR            | 650    | 605                      | NR            | 780    | 14                       | NR            | 910    | 0                        | NR            |
| 395    | 2                        | NR            | 525    | 555                      | NR            | 655    | 545                      | NR            | 785    | 12                       | NR            | 915    | 0                        | NR            |
| 400    | 4                        | NR            | 530    | 581                      | NR            | 660    | 485                      | NR            | 790    | 10                       | NR            | 920    | 0                        | NR            |
| 405    | 7                        | NR            | 535    | 604                      | NR            | 665    | 430                      | NR            | 795    | 9                        | NR            | 925    | 0                        | NR            |
| 410    | 17                       | NR            | 540    | 623                      | NR            | 670    | 378                      | NR            | 800    | 8                        | NR            | 930    | 0                        | NR            |
| 415    | 34                       | NR            | 545    | 645                      | NR            | 675    | 331                      | NR            | 805    | 7                        | NR            | 935    | 0                        | NR            |
| 420    | 68                       | NR            | 550    | 667                      | NR            | 680    | 290                      | NR            | 810    | 6                        | NR            | 940    | 0                        | NR            |
| 425    | 128                      | NR            | 555    | 693                      | NR            | 685    | 251                      | NR            | 815    | 5                        | NR            | 945    | 0                        | NR            |
| 430    | 214                      | NR            | 560    | 719                      | NR            | 690    | 218                      | NR            | 820    | 4                        | NR            | 950    | 0                        | NR            |
| 435    | 339                      | NR            | 565    | 754                      | NR            | 695    | 188                      | NR            | 825    | 4                        | NR            | 955    | 0                        | NR            |
| 440    | 507                      | NR            | 570    | 791                      | NR            | 700    | 162                      | NR            | 830    | 3                        | NR            | 960    | 0                        | NR            |
| 445    | 573                      | NR            | 575    | 830                      | NR            | 705    | 139                      | NR            | 835    | 3                        | NR            | 965    | 0                        | NR            |
| 450    | 356                      | NR            | 580    | 873                      | NR            | 710    | 119                      | NR            | 840    | 3                        | NR            | 970    | 0                        | NR            |
| 455    | 217                      | NR            | 585    | 913                      | NR            | 715    | 102                      | NR            | 845    | 2                        | NR            | 975    | 0                        | NR            |
| 460    | 168                      | NR            | 590    | 948                      | NR            | 720    | 88                       | NR            | 850    | 2                        | NR            | 980    | 0                        | NR            |
| 465    | 113                      | NR            | 595    | 974                      | NR            | 725    | 76                       | NR            | 855    | 2                        | NR            | 985    | 0                        | NR            |
| 470    | 85                       | NR            | 600    | 994                      | NR            | 730    | 65                       | NR            | 860    | 1                        | NR            | 990    | 0                        | NR            |
| 475    | 85                       | NR            | 605    | 998                      | NR            | 735    | 55                       | NR            | 865    | 1                        | NR            | 995    | 0                        | NR            |
| 480    | 94                       | NR            | 610    | 994                      | NR            | 740    | 47                       | NR            | 870    | 1                        | NR            | 1000   | 0                        | NR            |
| 485    | 120                      | NR            | 615    | 973                      | NR            | 745    | 41                       | NR            | 875    | 1                        | NR            |        |                          |               |

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### Melanopic Flux vs. Wavelength


**Melanopic Lumens: NR**
**M/P: 2.32**

| $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) |
|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|
| 360               | 0                                    | NR                             | 490               | 168                                  | NR                             | 620               | 940                                  | NR                             | 750               | 35                                   | NR                             | 880               | 1                                    | NR                             |
| 365               | 0                                    | NR                             | 495               | 233                                  | NR                             | 625               | 897                                  | NR                             | 755               | 30                                   | NR                             | 885               | 1                                    | NR                             |
| 370               | 0                                    | NR                             | 500               | 300                                  | NR                             | 630               | 847                                  | NR                             | 760               | 26                                   | NR                             | 890               | 1                                    | NR                             |
| 375               | 0                                    | NR                             | 505               | 372                                  | NR                             | 635               | 790                                  | NR                             | 765               | 22                                   | NR                             | 895               | 1                                    | NR                             |
| 380               | 0                                    | NR                             | 510               | 430                                  | NR                             | 640               | 730                                  | NR                             | 770               | 19                                   | NR                             | 900               | 1                                    | NR                             |
| 385               | 0                                    | NR                             | 515               | 483                                  | NR                             | 645               | 668                                  | NR                             | 775               | 16                                   | NR                             | 905               | 1                                    | NR                             |
| 390               | 0                                    | NR                             | 520               | 524                                  | NR                             | 650               | 605                                  | NR                             | 780               | 14                                   | NR                             | 910               | 0                                    | NR                             |
| 395               | 2                                    | NR                             | 525               | 555                                  | NR                             | 655               | 545                                  | NR                             | 785               | 12                                   | NR                             | 915               | 0                                    | NR                             |
| 400               | 4                                    | NR                             | 530               | 581                                  | NR                             | 660               | 485                                  | NR                             | 790               | 10                                   | NR                             | 920               | 0                                    | NR                             |
| 405               | 7                                    | NR                             | 535               | 604                                  | NR                             | 665               | 430                                  | NR                             | 795               | 9                                    | NR                             | 925               | 0                                    | NR                             |
| 410               | 17                                   | NR                             | 540               | 623                                  | NR                             | 670               | 378                                  | NR                             | 800               | 8                                    | NR                             | 930               | 0                                    | NR                             |
| 415               | 34                                   | NR                             | 545               | 645                                  | NR                             | 675               | 331                                  | NR                             | 805               | 7                                    | NR                             | 935               | 0                                    | NR                             |
| 420               | 68                                   | NR                             | 550               | 667                                  | NR                             | 680               | 290                                  | NR                             | 810               | 6                                    | NR                             | 940               | 0                                    | NR                             |
| 425               | 128                                  | NR                             | 555               | 693                                  | NR                             | 685               | 251                                  | NR                             | 815               | 5                                    | NR                             | 945               | 0                                    | NR                             |
| 430               | 214                                  | NR                             | 560               | 719                                  | NR                             | 690               | 218                                  | NR                             | 820               | 4                                    | NR                             | 950               | 0                                    | NR                             |
| 435               | 339                                  | NR                             | 565               | 754                                  | NR                             | 695               | 188                                  | NR                             | 825               | 4                                    | NR                             | 955               | 0                                    | NR                             |
| 440               | 507                                  | NR                             | 570               | 791                                  | NR                             | 700               | 162                                  | NR                             | 830               | 3                                    | NR                             | 960               | 0                                    | NR                             |
| 445               | 573                                  | NR                             | 575               | 830                                  | NR                             | 705               | 139                                  | NR                             | 835               | 3                                    | NR                             | 965               | 0                                    | NR                             |
| 450               | 356                                  | NR                             | 580               | 873                                  | NR                             | 710               | 119                                  | NR                             | 840               | 3                                    | NR                             | 970               | 0                                    | NR                             |
| 455               | 217                                  | NR                             | 585               | 913                                  | NR                             | 715               | 102                                  | NR                             | 845               | 2                                    | NR                             | 975               | 0                                    | NR                             |
| 460               | 168                                  | NR                             | 590               | 948                                  | NR                             | 720               | 88                                   | NR                             | 850               | 2                                    | NR                             | 980               | 0                                    | NR                             |
| 465               | 113                                  | NR                             | 595               | 974                                  | NR                             | 725               | 76                                   | NR                             | 855               | 2                                    | NR                             | 985               | 0                                    | NR                             |
| 470               | 85                                   | NR                             | 600               | 994                                  | NR                             | 730               | 65                                   | NR                             | 860               | 1                                    | NR                             | 990               | 0                                    | NR                             |
| 475               | 85                                   | NR                             | 605               | 998                                  | NR                             | 735               | 55                                   | NR                             | 865               | 1                                    | NR                             | 995               | 0                                    | NR                             |
| 480               | 94                                   | NR                             | 610               | 994                                  | NR                             | 740               | 47                                   | NR                             | 870               | 1                                    | NR                             | 1000              | 0                                    | NR                             |
| 485               | 120                                  | NR                             | 615               | 973                                  | NR                             | 745               | 41                                   | NR                             | 875               | 1                                    | NR                             |                   |                                      |                                |

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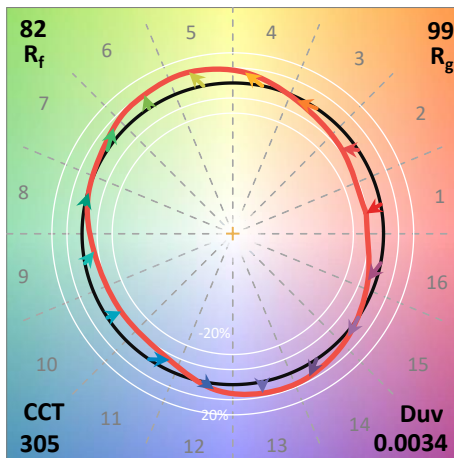
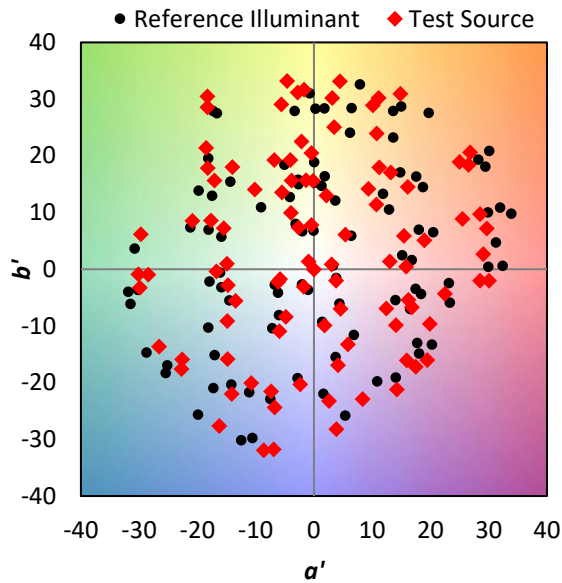
TM-30-18

### Summary

$R_f = 81.5$   
 $R_g = 99.2$   
 $CIE R_a = 81.0$   
 $R_9 = 7.1$



### Color Vector Graphics

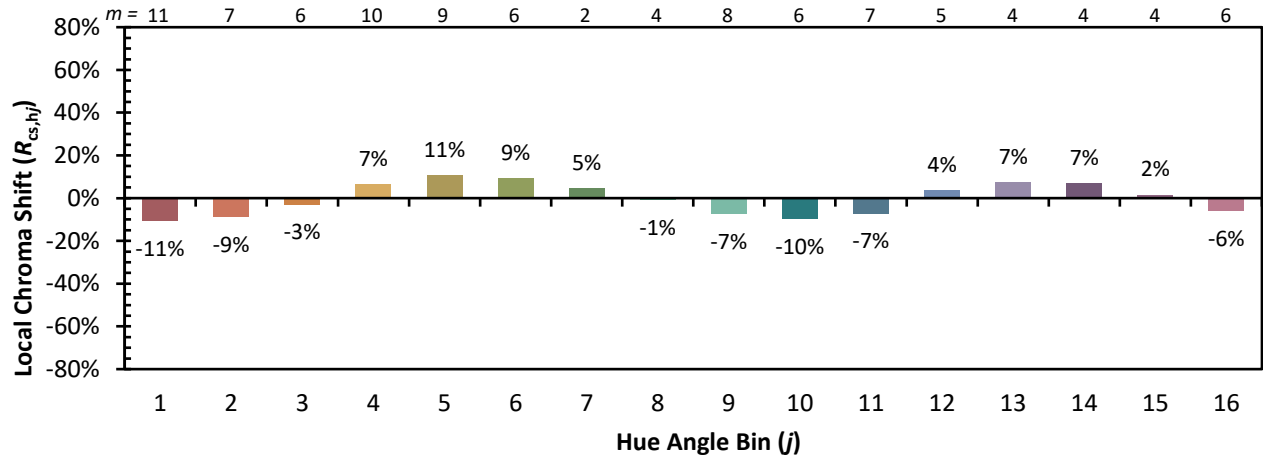




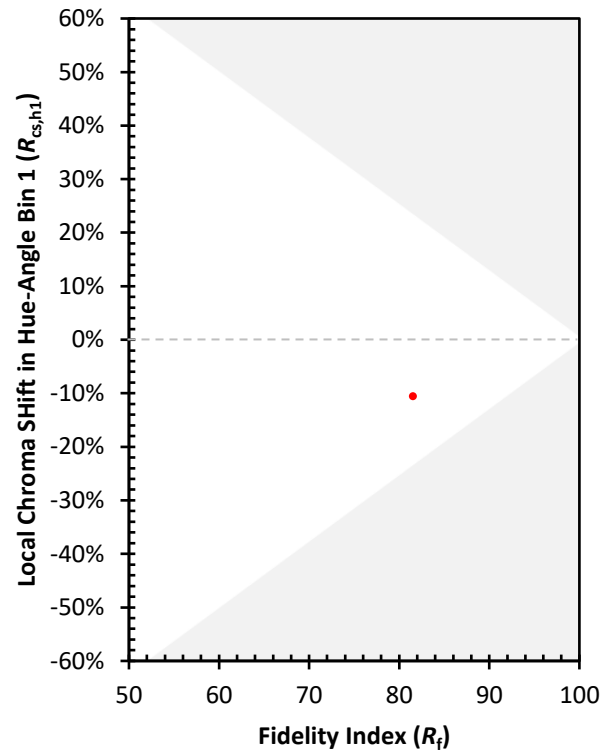
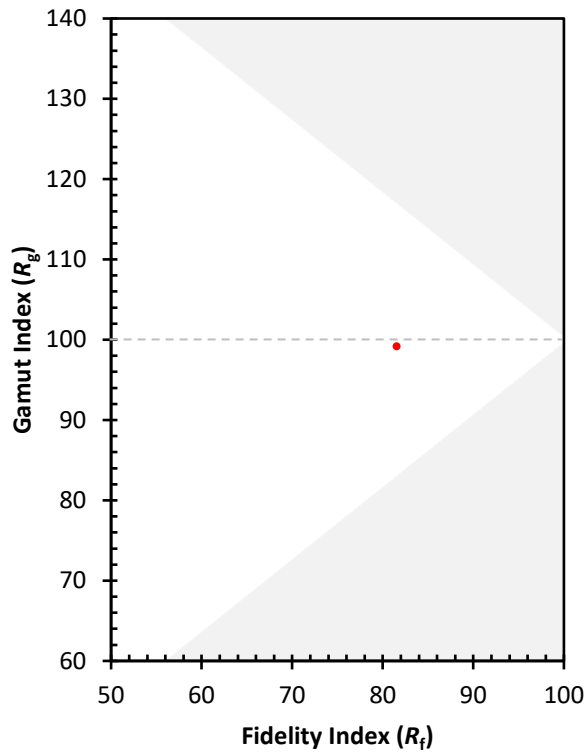
**Individual Sample Fidelity Index ( $R_{f,i}$ )**

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 74 | CES51 = 89 | CES76 = 70 |
| CES02 = 63 | CES27 = 88 | CES52 = 92 | CES77 = 86 |
| CES03 = 31 | CES28 = 89 | CES53 = 81 | CES78 = 72 |
| CES04 = 70 | CES29 = 67 | CES54 = 87 | CES79 = 90 |
| CES05 = 50 | CES30 = 68 | CES55 = 85 | CES80 = 88 |
| CES06 = 51 | CES31 = 71 | CES56 = 78 | CES81 = 78 |
| CES07 = 42 | CES32 = 70 | CES57 = 76 | CES82 = 95 |
| CES08 = 41 | CES33 = 71 | CES58 = 78 | CES83 = 90 |
| CES09 = 29 | CES34 = 82 | CES59 = 92 | CES84 = 94 |
| CES10 = 76 | CES35 = 90 | CES60 = 95 | CES85 = 86 |
| CES11 = 59 | CES36 = 93 | CES61 = 93 | CES86 = 72 |
| CES12 = 65 | CES37 = 87 | CES62 = 83 | CES87 = 85 |
| CES13 = 43 | CES38 = 75 | CES63 = 77 | CES88 = 83 |
| CES14 = 74 | CES39 = 94 | CES64 = 83 | CES89 = 75 |
| CES15 = 71 | CES40 = 89 | CES65 = 77 | CES90 = 81 |
| CES16 = 47 | CES41 = 85 | CES66 = 80 | CES91 = 96 |
| CES17 = 50 | CES42 = 86 | CES67 = 79 | CES92 = 73 |
| CES18 = 56 | CES43 = 81 | CES68 = 84 | CES93 = 84 |
| CES19 = 72 | CES44 = 99 | CES69 = 91 | CES94 = 64 |
| CES20 = 66 | CES45 = 87 | CES70 = 78 | CES95 = 80 |
| CES21 = 87 | CES46 = 82 | CES71 = 76 | CES96 = 84 |
| CES22 = 79 | CES47 = 77 | CES72 = 92 | CES97 = 87 |
| CES23 = 92 | CES48 = 71 | CES73 = 71 | CES98 = 81 |
| CES24 = 91 | CES49 = 81 | CES74 = 93 | CES99 = 74 |
| CES25 = 72 | CES50 = 89 | CES75 = 74 |            |



**Color Rendition by Hue-Angle Bin**


**Measure Comparisons**



(END OF REPORT)