

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: P321771

Luminaire Tested: **GLEON-SA7C-830-U-T3R-HSS**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P321771  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-11)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA7C-830-U-T3R-HSS  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(7) 80 CRI, 3000K, 1050mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE III  
ROADWAY OPTICS WITH HOUSE SIDE SHIELD  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 30576 lumens  
Efficiency: N/A  
Efficacy: 78.2 lumens/watt  
Luminous Opening: Rectangular (W 2' x L: 1' x H: 0')  
IES Classification: Type III - Medium  
BUG Rating: B3 - U0 - G5

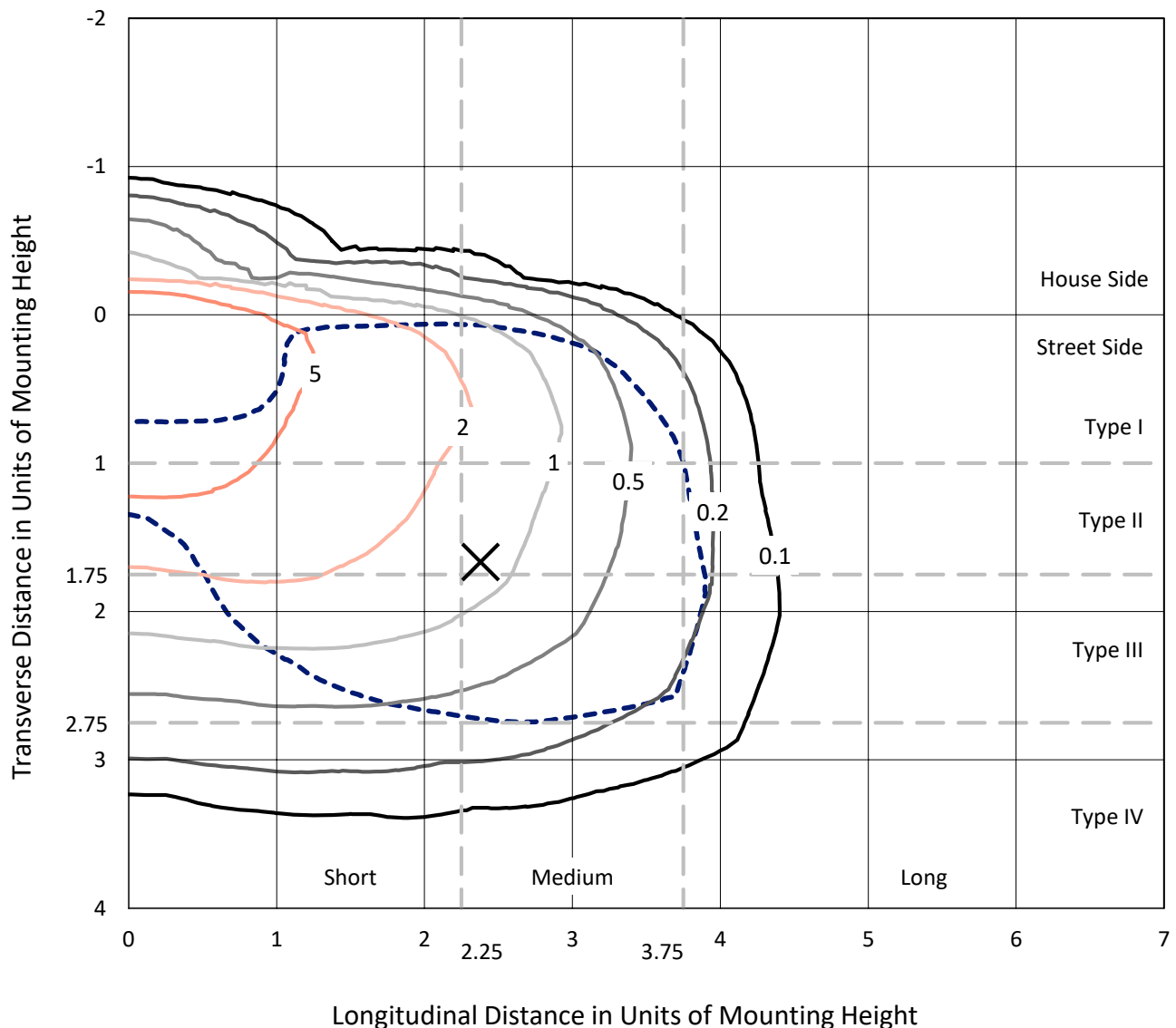
Input Watts (W): 391  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



REPORT NUMBER: P321771  
 CATALOG NUMBER: GLEON-SA7C-830-U-T3R-HSS

## Iso-Footcandle Lines of Horizontal Illumination

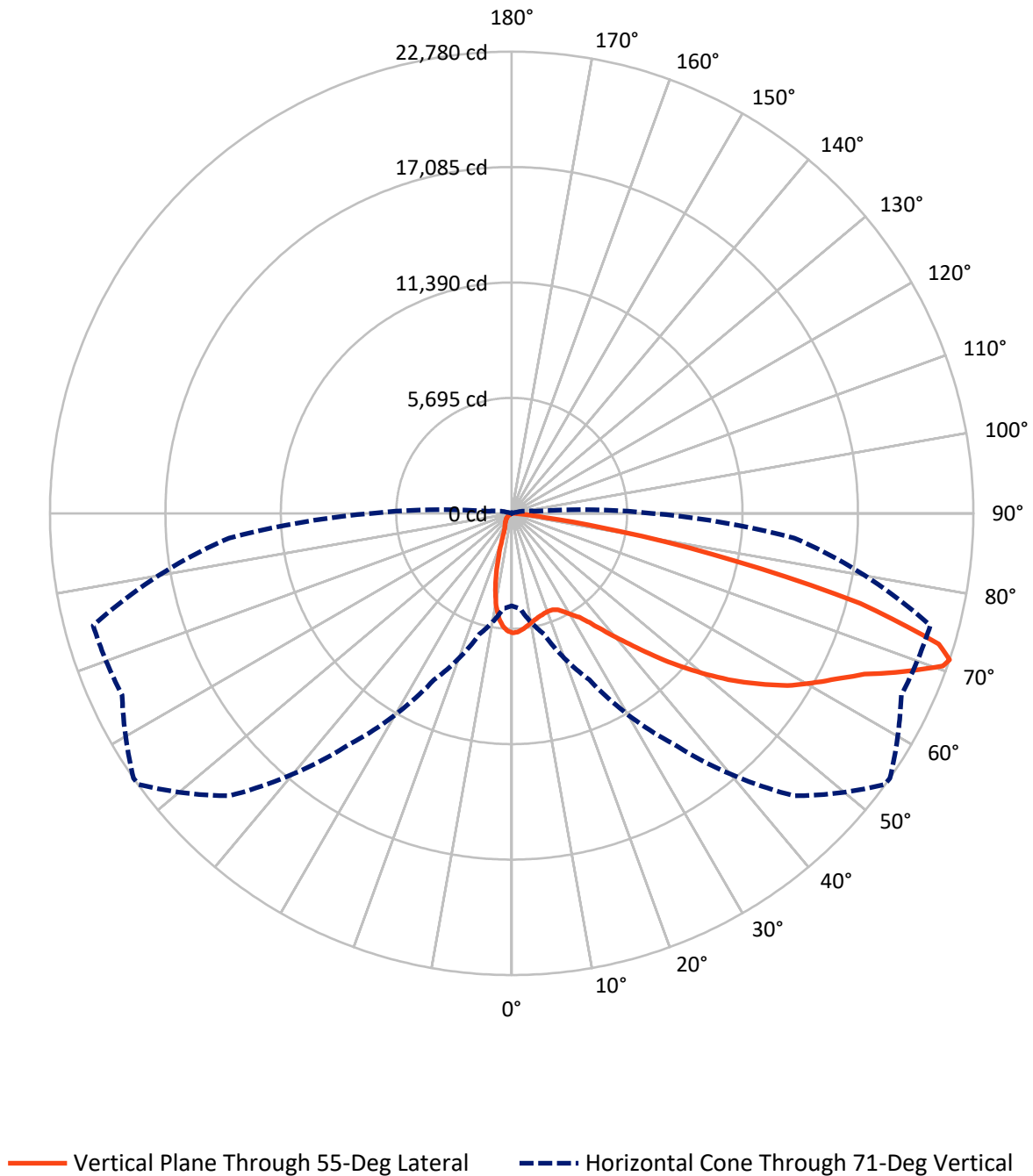
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 9.7 fc  
 Type III - Medium - N/A

REPORT NUMBER: P321771  
CATALOG NUMBER: GLEON-SA7C-830-U-T3R-HSS

## Luminous Intensity Polar Plot



REPORT NUMBER: P321771  
 CATALOG NUMBER: GLEON-SA7C-830-U-T3R-HSS

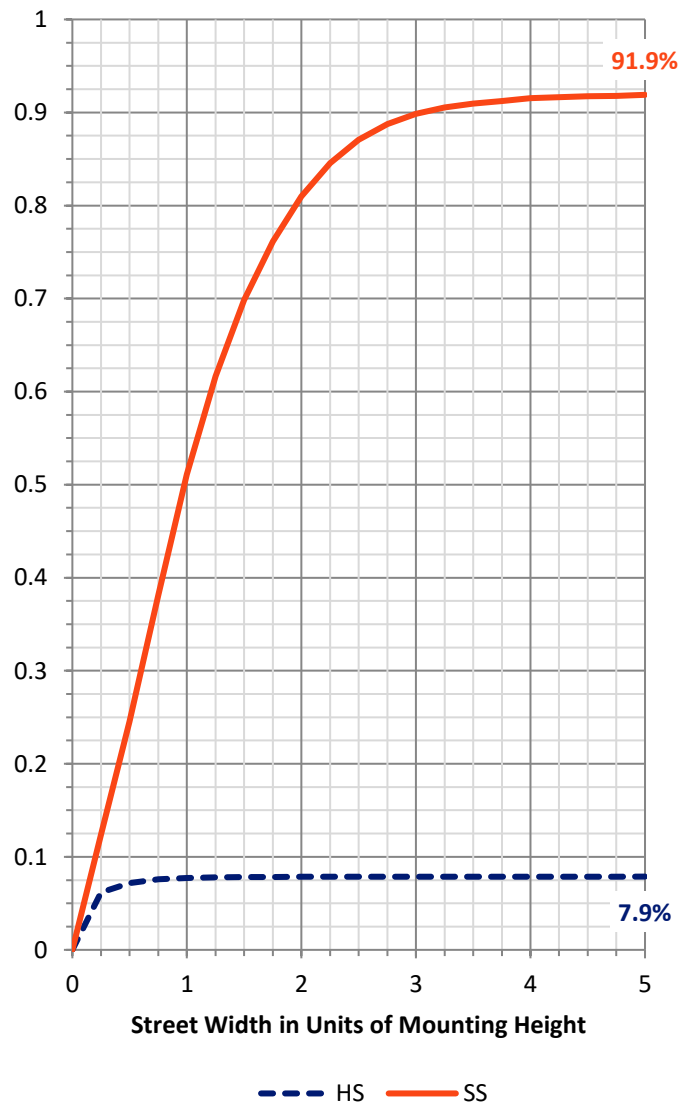
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 2420.8   | 0.0    | 2420.8  |
|                    | % Fixture | 7.9      | 0.0    | 7.9     |
| <b>Street Side</b> | Lumens    | 28155.2  | 0.0    | 28155.2 |
|                    | % Fixture | 92.1     | 0.0    | 92.1    |
| <b>Total</b>       | Lumens    | 30576.0  | 0.0    | 30576.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 502.8   | 1.6       |
| 10°-20°   | 1135.0  | 3.7       |
| 20°-30°   | 1824.1  | 6.0       |
| 30°-40°   | 3099.2  | 10.1      |
| 40°-50°   | 4810.3  | 15.7      |
| 50°-60°   | 6467.3  | 21.2      |
| 60°-70°   | 7911.6  | 25.9      |
| 70°-80°   | 4625.8  | 15.1      |
| 80°-90°   | 200.0   | 0.7       |
| 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°    | 30576.0 | 100.0     |
| 0°-180°   | 30576.0 | 100.0     |

**Coefficient of Utilization**



REPORT NUMBER: P321771

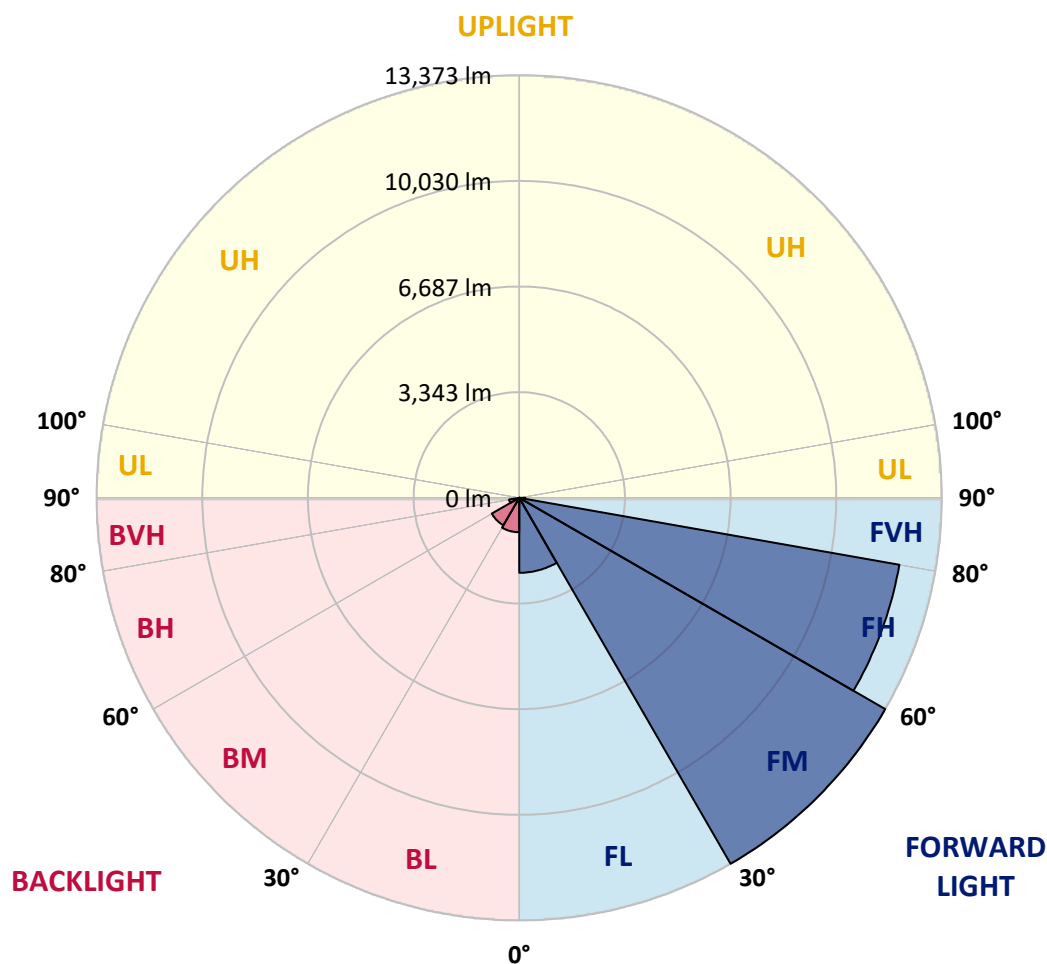
CATALOG NUMBER: GLEON-SA7C-830-U-T3R-HSS

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

| Zone |             | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |        |
|------|-------------|---------|-----------|-------------------------|------|--------|
|      |             |         |           | B                       | U    | G      |
| FL   | (0°-30°)    | 2372.3  | 7.8       |                         |      |        |
| FM   | (30°-60°)   | 13373.1 | 43.7      |                         |      |        |
| FH   | (60°-80°)   | 12213.1 | 39.9      |                         |      | G5     |
| FVH  | (80°-90°)   | 196.8   | 0.6       |                         |      | G2/225 |
| BL   | (0°-30°)    | 1089.6  | 3.6       | B3/2500                 |      |        |
| BM   | (30°-60°)   | 1003.7  | 3.3       | B2/2500                 |      |        |
| BH   | (60°-80°)   | 324.3   | 1.1       | B1/500                  |      | G1/500 |
| BVH  | (80°-90°)   | 3.2     | 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 III Medium





REPORT NUMBER: P321771

CATALOG NUMBER: GLEON-SA7C-830-U-T3R-HSS

**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 45°     | 54°     | 55°     | 65°     | 75°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 5896.7  | 5896.7  | 5896.7  | 5896.7  | 5896.7  | 5896.7  | 5896.7  | 5896.7  | 5896.7  | 5896.7  | 5896.7  |
| 2.5°  | 5723.7  | 5730.6  | 5755.3  | 5766.3  | 5792.3  | 5836.3  | 5858.2  | 5859.6  | 5895.3  | 5909.0  | 5920.0  |
| 5°    | 5318.7  | 5359.9  | 5401.1  | 5445.0  | 5524.6  | 5630.3  | 5734.7  | 5744.3  | 5859.6  | 5944.7  | 5990.0  |
| 7.5°  | 4970.0  | 5007.0  | 5056.5  | 5126.5  | 5239.1  | 5405.2  | 5579.5  | 5600.1  | 5818.4  | 6012.0  | 6113.6  |
| 10°   | 4611.6  | 4641.8  | 4713.2  | 4816.2  | 4971.3  | 5193.8  | 5428.5  | 5462.8  | 5781.4  | 6102.6  | 6281.1  |
| 12.5° | 4228.6  | 4246.4  | 4332.9  | 4481.2  | 4709.1  | 4991.9  | 5300.8  | 5346.2  | 5758.0  | 6207.0  | 6478.8  |
| 15°   | 3937.5  | 3945.8  | 4028.1  | 4181.9  | 4442.8  | 4810.7  | 5202.0  | 5256.9  | 5763.5  | 6331.9  | 6694.4  |
| 17.5° | 3863.4  | 3867.5  | 3911.4  | 4017.2  | 4247.8  | 4648.7  | 5123.7  | 5191.0  | 5780.0  | 6454.1  | 6911.3  |
| 20°   | 4164.1  | 4135.2  | 4089.9  | 4073.5  | 4172.3  | 4551.2  | 5077.1  | 5152.6  | 5802.0  | 6562.6  | 7106.2  |
| 22.5° | 4989.2  | 4904.1  | 4716.0  | 4464.7  | 4312.3  | 4558.1  | 5089.4  | 5164.9  | 5872.0  | 6695.7  | 7331.4  |
| 25°   | 6213.8  | 6095.8  | 5775.9  | 5281.6  | 4806.6  | 4755.8  | 5192.4  | 5269.3  | 6007.9  | 6855.0  | 7546.9  |
| 27.5° | 7607.3  | 7490.7  | 7099.4  | 6393.7  | 5583.7  | 5147.1  | 5428.5  | 5499.9  | 6209.7  | 6996.4  | 7711.7  |
| 30°   | 8941.8  | 8908.9  | 8447.6  | 7645.8  | 6561.2  | 5781.4  | 5733.3  | 5793.7  | 6359.4  | 7081.5  | 7842.1  |
| 32.5° | 10073.1 | 10020.9 | 9650.3  | 8870.4  | 7680.1  | 6543.3  | 6091.6  | 6109.5  | 6471.9  | 7191.4  | 8012.4  |
| 35°   | 11122.0 | 11057.5 | 10732.1 | 9994.9  | 8827.9  | 7474.2  | 6643.6  | 6617.5  | 6717.7  | 7412.4  | 8259.5  |
| 37.5° | 12037.8 | 12096.8 | 11735.7 | 11034.2 | 9857.6  | 8442.1  | 7387.7  | 7309.4  | 7102.1  | 7772.1  | 8617.8  |
| 40°   | 12803.9 | 12803.9 | 12615.8 | 12030.9 | 10969.6 | 9442.9  | 8229.3  | 8126.3  | 7680.1  | 8326.8  | 9072.3  |
| 42.5° | 13079.8 | 13138.8 | 13208.9 | 12878.0 | 11965.0 | 10483.6 | 9167.0  | 9059.9  | 8494.3  | 9113.4  | 9646.1  |
| 45°   | 13096.3 | 13189.6 | 13548.0 | 13546.6 | 12864.3 | 11517.4 | 10224.1 | 10173.3 | 9537.7  | 10123.9 | 10357.3 |
| 47.5° | 12864.3 | 12981.0 | 13571.3 | 13906.3 | 13576.8 | 12479.8 | 11380.1 | 11317.0 | 10763.7 | 11362.3 | 11101.4 |
| 50°   | 12505.9 | 12635.0 | 13321.4 | 14047.7 | 14061.4 | 13317.3 | 12597.9 | 12503.2 | 12113.3 | 12777.8 | 11870.3 |
| 52.5° | 11864.8 | 12114.6 | 13097.7 | 14080.7 | 14380.0 | 14040.9 | 13756.7 | 13715.5 | 13623.5 | 14141.1 | 12482.6 |
| 55°   | 10493.2 | 10770.6 | 12536.1 | 14091.7 | 14675.1 | 14682.0 | 14842.6 | 14853.6 | 15039.0 | 15415.1 | 12938.4 |
| 57.5° | 9845.2  | 10001.7 | 11555.9 | 14143.8 | 15113.1 | 15409.7 | 15949.2 | 16034.3 | 16321.3 | 16624.7 | 13458.7 |
| 60°   | 9437.5  | 9622.8  | 11072.6 | 14072.4 | 15800.9 | 16363.8 | 16974.8 | 17003.6 | 17311.1 | 17872.7 | 14163.0 |
| 62.5° | 9112.1  | 9294.7  | 10767.8 | 13797.8 | 16573.9 | 17511.6 | 17977.0 | 17979.8 | 18210.4 | 19359.5 | 14963.5 |
| 65°   | 8308.9  | 8462.7  | 10151.4 | 13488.9 | 17084.6 | 18647.0 | 19141.3 | 19123.4 | 19311.5 | 20927.4 | 15892.9 |
| 67.5° | 7147.4  | 7265.5  | 8892.4  | 12317.8 | 16892.4 | 19679.4 | 20898.6 | 20839.6 | 20611.6 | 22282.5 | 16258.1 |
| 70°   | 5526.0  | 5568.6  | 7008.8  | 10265.3 | 15091.1 | 20076.2 | 22596.9 | 22566.7 | 21409.3 | 22039.5 | 14919.5 |
| 71°   | 4567.7  | 4707.7  | 6176.8  | 9059.9  | 13884.3 | 19709.6 | 22761.6 | 22779.5 | 21208.9 | 21377.7 | 13998.3 |
| 72.5° | 2652.5  | 2771.9  | 4477.1  | 6958.0  | 11787.9 | 18180.2 | 21907.7 | 22036.7 | 20272.5 | 19444.7 | 11956.8 |
| 75°   | 568.4   | 608.2   | 1659.9  | 3367.8  | 6484.3  | 12742.1 | 17291.9 | 17751.9 | 16523.1 | 13228.1 | 7206.5  |
| 77.5° | 395.4   | 427.0   | 711.2   | 1528.1  | 2143.1  | 6296.2  | 10741.7 | 11260.7 | 9871.3  | 4971.3  | 2306.5  |
| 80°   | 313.0   | 348.7   | 554.7   | 755.1   | 579.4   | 2030.5  | 5031.8  | 5348.9  | 3292.3  | 1109.3  | 388.5   |
| 82.5° | 174.4   | 207.3   | 432.5   | 407.8   | 222.4   | 385.8   | 1408.6  | 1592.6  | 659.0   | 223.8   | 92.0    |
| 85°   | 50.8    | 61.8    | 278.7   | 296.6   | 94.7    | 74.1    | 240.3   | 297.9   | 124.9   | 59.0    | 41.2    |
| 87.5° | 0.0     | 0.0     | 134.5   | 114.0   | 27.5    | 11.0    | 22.0    | 24.7    | 24.7    | 24.7    | 27.5    |
| 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: P321771

CATALOG NUMBER: GLEON-SA7C-830-U-T3R-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 5896.7 | 5896.7 | 5896.7 | 5896.7 | 5896.7 | 5896.7 | 5896.7 | 5896.7 | 5896.7 | 5896.7 | 5896.7 |
| 2.5°  | 5920.0 | 5929.6 | 5895.3 | 5850.0 | 5802.0 | 5742.9 | 5681.1 | 5633.1 | 5631.7 | 5608.4 | 5585.0 |
| 5°    | 5992.8 | 5987.3 | 5892.6 | 5748.4 | 5578.2 | 5401.1 | 5232.2 | 5041.4 | 4978.2 | 4900.0 | 4873.9 |
| 7.5°  | 6127.3 | 6088.9 | 5888.5 | 5572.7 | 5199.2 | 4828.6 | 4445.5 | 4059.7 | 3895.0 | 3746.7 | 3720.6 |
| 10°   | 6296.2 | 6223.4 | 5862.4 | 5309.1 | 4624.0 | 3940.3 | 3362.3 | 2837.8 | 2607.2 | 2430.1 | 2421.8 |
| 12.5° | 6471.9 | 6360.7 | 5789.6 | 4910.9 | 3870.3 | 2909.2 | 2243.4 | 1727.1 | 1534.9 | 1411.4 | 1422.3 |
| 15°   | 6655.9 | 6489.8 | 5633.1 | 4374.1 | 3012.2 | 1974.3 | 1378.4 | 1075.0 | 998.1  | 966.5  | 974.8  |
| 17.5° | 6844.0 | 6579.0 | 5414.8 | 3727.5 | 2165.1 | 1274.1 | 954.2  | 869.1  | 869.1  | 875.9  | 878.7  |
| 20°   | 7007.4 | 6627.1 | 5093.5 | 3002.6 | 1467.7 | 928.1  | 834.7  | 822.4  | 829.2  | 840.2  | 841.6  |
| 22.5° | 7169.4 | 6629.8 | 4674.8 | 2268.1 | 1026.9 | 812.8  | 794.9  | 789.4  | 793.5  | 805.9  | 807.3  |
| 25°   | 7301.2 | 6596.9 | 4150.3 | 1613.2 | 819.6  | 766.1  | 757.9  | 755.1  | 757.9  | 773.0  | 773.0  |
| 27.5° | 7354.7 | 6477.4 | 3510.6 | 1134.0 | 734.5  | 713.9  | 711.2  | 713.9  | 718.0  | 729.0  | 730.4  |
| 30°   | 7360.2 | 6268.8 | 2813.1 | 821.0  | 665.9  | 643.9  | 649.4  | 659.0  | 654.9  | 652.1  | 654.9  |
| 32.5° | 7374.0 | 6027.1 | 2133.5 | 675.5  | 608.2  | 573.9  | 567.0  | 567.0  | 550.5  | 540.9  | 535.4  |
| 35°   | 7419.3 | 5742.9 | 1547.3 | 606.8  | 549.2  | 509.4  | 483.3  | 453.1  | 421.5  | 405.0  | 400.9  |
| 37.5° | 7490.7 | 5445.0 | 1107.9 | 561.5  | 497.0  | 451.7  | 402.3  | 348.7  | 303.4  | 291.1  | 291.1  |
| 40°   | 7621.1 | 5137.5 | 819.6  | 525.8  | 455.8  | 399.5  | 325.4  | 255.4  | 214.2  | 207.3  | 207.3  |
| 42.5° | 7827.0 | 4813.5 | 653.5  | 494.3  | 420.1  | 346.0  | 248.5  | 185.3  | 155.1  | 151.0  | 149.6  |
| 45°   | 8041.2 | 4456.5 | 571.1  | 464.0  | 381.7  | 284.2  | 184.0  | 137.3  | 119.4  | 115.3  | 115.3  |
| 47.5° | 8255.4 | 4076.2 | 531.3  | 435.2  | 344.6  | 221.0  | 137.3  | 108.5  | 100.2  | 100.2  | 101.6  |
| 50°   | 8436.6 | 3679.4 | 502.5  | 403.6  | 296.6  | 167.5  | 108.5  | 92.0   | 89.2   | 94.7   | 96.1   |
| 52.5° | 8481.9 | 3289.5 | 466.8  | 363.8  | 237.5  | 127.7  | 89.2   | 81.0   | 81.0   | 81.0   | 81.0   |
| 55°   | 8454.4 | 2987.5 | 420.1  | 314.4  | 175.7  | 101.6  | 76.9   | 71.4   | 70.0   | 70.0   | 70.0   |
| 57.5° | 8547.8 | 2809.0 | 336.4  | 244.4  | 126.3  | 82.4   | 67.3   | 63.2   | 60.4   | 59.0   | 59.0   |
| 60°   | 8735.9 | 2692.3 | 240.3  | 175.7  | 94.7   | 68.6   | 57.7   | 53.5   | 49.4   | 46.7   | 46.7   |
| 62.5° | 8985.8 | 2590.7 | 178.5  | 130.4  | 72.8   | 54.9   | 48.1   | 43.9   | 38.4   | 35.7   | 35.7   |
| 65°   | 9178.0 | 2409.5 | 135.9  | 97.5   | 54.9   | 43.9   | 37.1   | 35.7   | 27.5   | 24.7   | 23.3   |
| 67.5° | 8884.2 | 2011.3 | 109.8  | 71.4   | 41.2   | 34.3   | 28.8   | 27.5   | 16.5   | 13.7   | 13.7   |
| 70°   | 7619.7 | 1400.4 | 87.9   | 52.2   | 30.2   | 27.5   | 23.3   | 17.8   | 12.4   | 11.0   | 11.0   |
| 71°   | 6909.9 | 1169.7 | 79.6   | 43.9   | 26.1   | 26.1   | 22.0   | 15.1   | 11.0   | 9.6    | 9.6    |
| 72.5° | 5740.2 | 830.6  | 67.3   | 34.3   | 23.3   | 27.5   | 23.3   | 13.7   | 11.0   | 9.6    | 8.2    |
| 75°   | 3332.1 | 347.3  | 46.7   | 23.3   | 17.8   | 33.0   | 30.2   | 12.4   | 8.2    | 6.9    | 6.9    |
| 77.5° | 1002.2 | 127.7  | 26.1   | 15.1   | 13.7   | 28.8   | 34.3   | 11.0   | 4.1    | 1.4    | 1.4    |
| 80°   | 182.6  | 54.9   | 16.5   | 9.6    | 9.6    | 17.8   | 26.1   | 5.5    | 0.0    | 0.0    | 0.0    |
| 82.5° | 64.5   | 27.5   | 9.6    | 5.5    | 4.1    | 8.2    | 12.4   | 0.0    | 0.0    | 0.0    | 0.0    |
| 85°   | 37.1   | 19.2   | 5.5    | 2.7    | 0.0    | 1.4    | 2.7    | 0.0    | 0.0    | 0.0    | 0.0    |
| 87.5° | 24.7   | 5.5    | 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-79-2019: 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           |

REPORT NUMBER: SP1-2408-195-9

**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

REPORT NUMBER: SP1-2408-195-9

### Photopic Flux vs. Wavelength

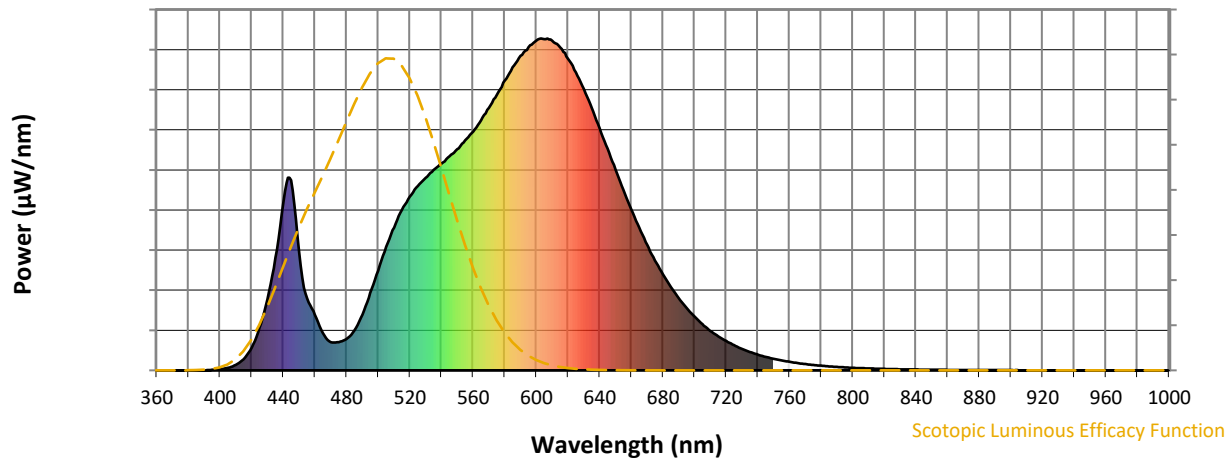


### Photopic Lumens: NR

| λ (nm) | Power W <sup>λ</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>λ</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>λ</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>λ</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>λ</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            |        |                          |               |

REPORT NUMBER: SP1-2408-195-9

### 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            |        |                          |               |

REPORT NUMBER: SP1-2408-195-9

### 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                             |                   |                                      |                                |

REPORT NUMBER: SP1-2408-195-9

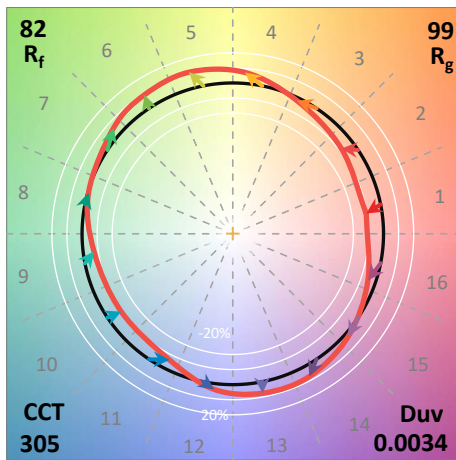
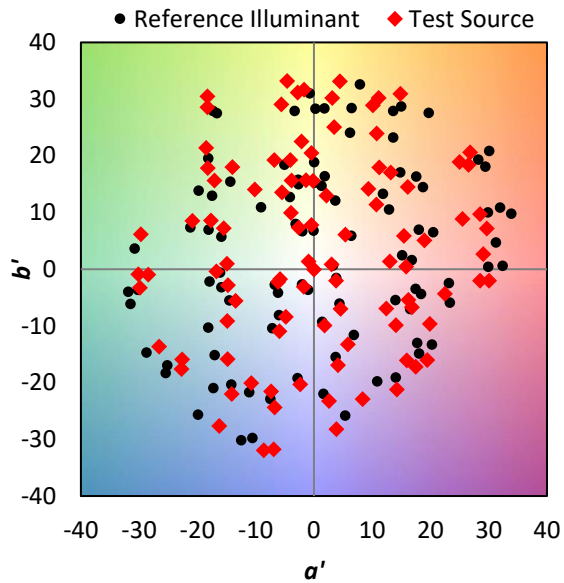
TM-30-18

### Summary

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



### Color Vector Graphics



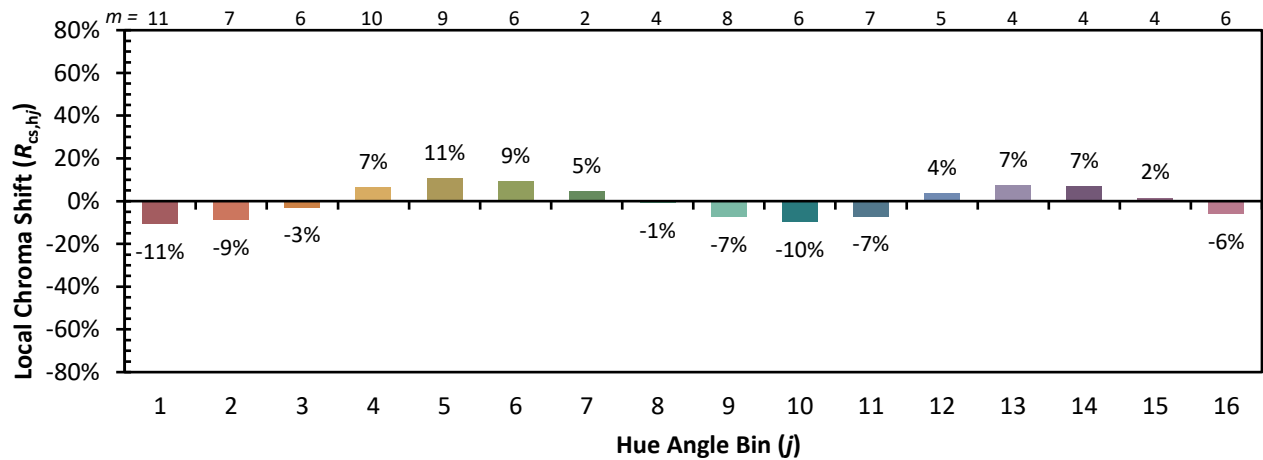


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

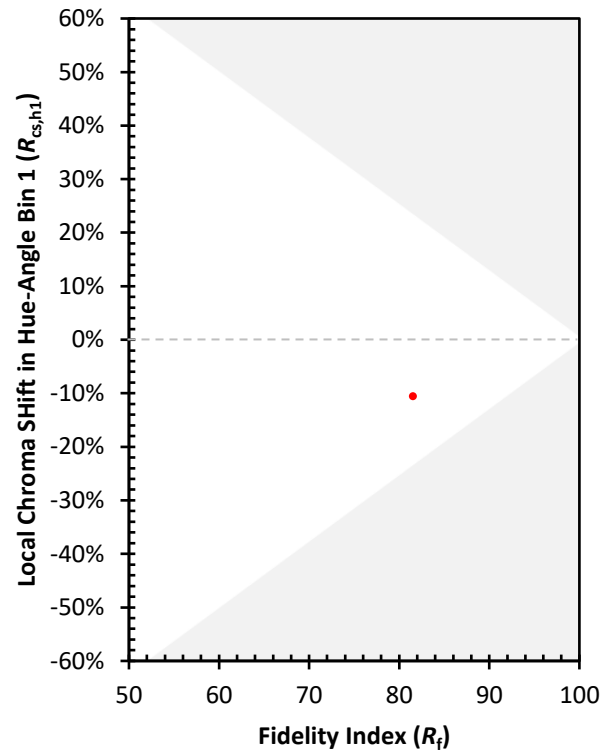
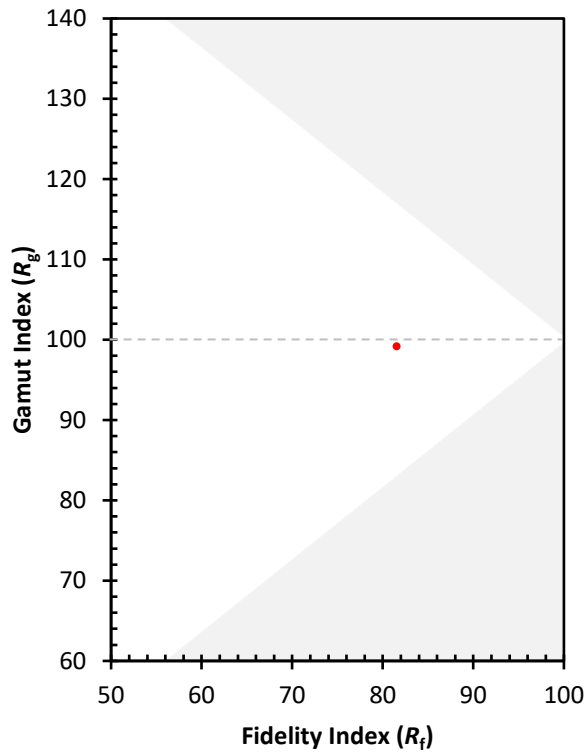
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 74 | CES51 = 89 | CES76 = 70 |
| CES02 = 63 | CES27 = 88 | CES52 = 92 | CES77 = 86 |
| CES03 = 31 | CES28 = 89 | CES53 = 81 | CES78 = 72 |
| CES04 = 70 | CES29 = 67 | CES54 = 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)