

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: P322512

Luminaire Tested: **GLEON-SA8A-730-U-T4FT-HSS**

Issue Date: 3/3/2020

### Test Information

Test Method: LM-79-08  
Report Number: P322512  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-17)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA8A-730-U-T4FT-HSS  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(8) 70 CRI, 3000K, 615mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE IV  
FORWARD THROW OPTICS WITH HOUSE SIDE SHIELD  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

### Summary

Lumens per Lamp: N/A  
Luminaire Lumens: 24153 lumens  
Efficiency: N/A  
Efficacy: 94.0 lumens/watt  
Luminous Opening: Rectangular (W 2' x L: 1' x H: 0')  
IES Classification: Type IV - Short  
BUG Rating: B2 - U0 - G4

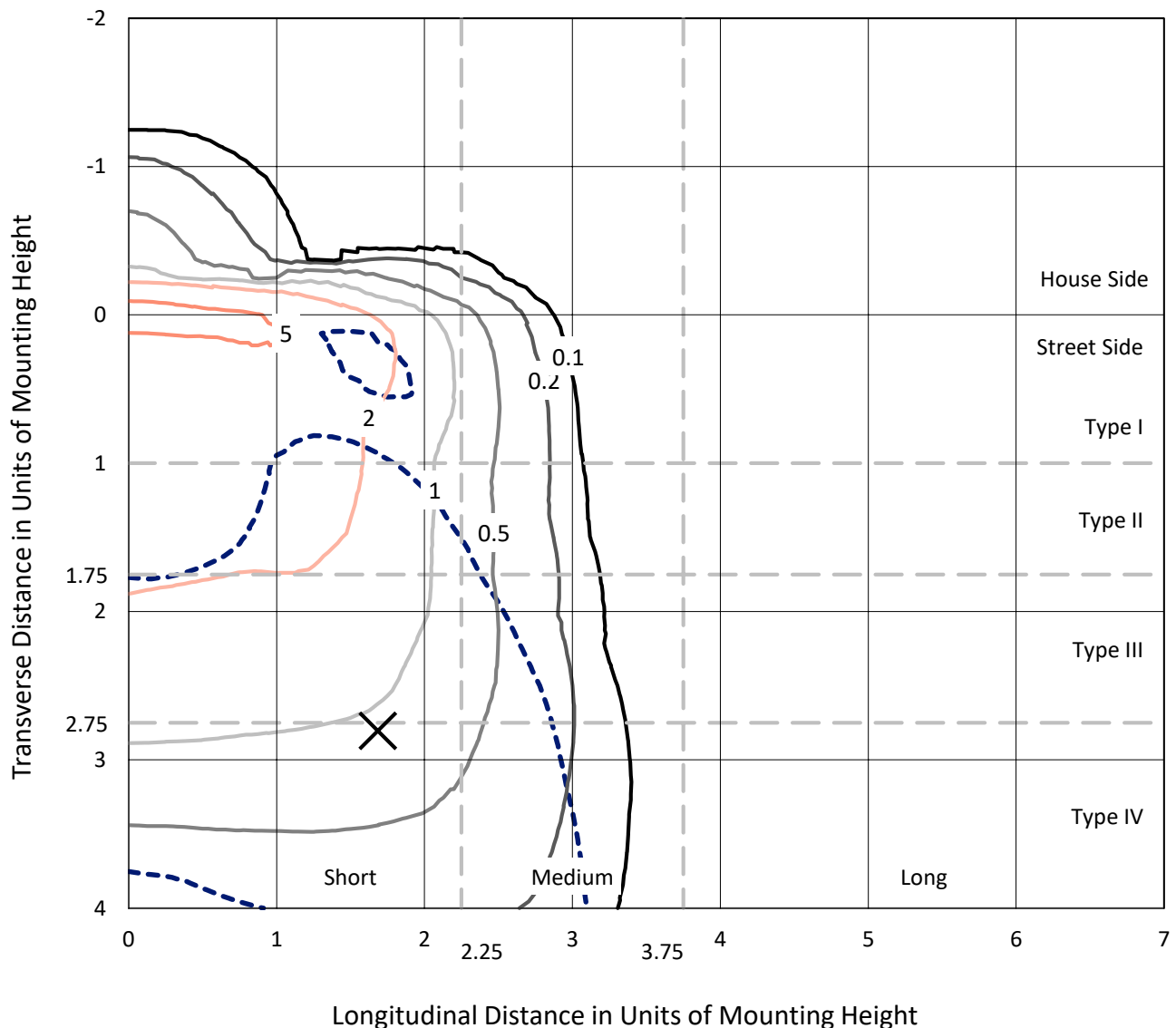
Input Watts (W): 257  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



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## Iso-Footcandle Lines of Horizontal Illumination

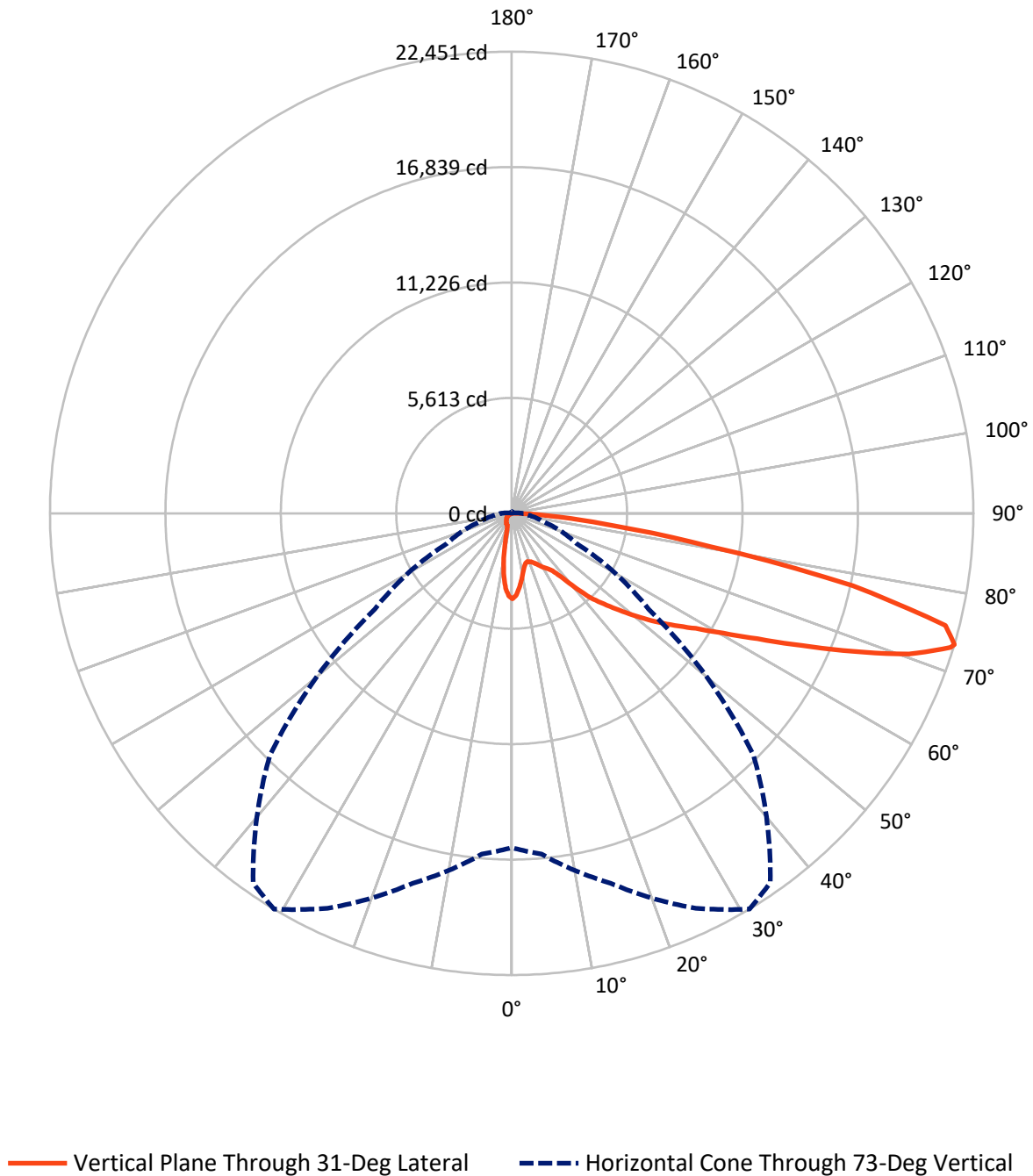
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 6.6 fc  
 Type IV - Short - N/A

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## Luminous Intensity Polar Plot



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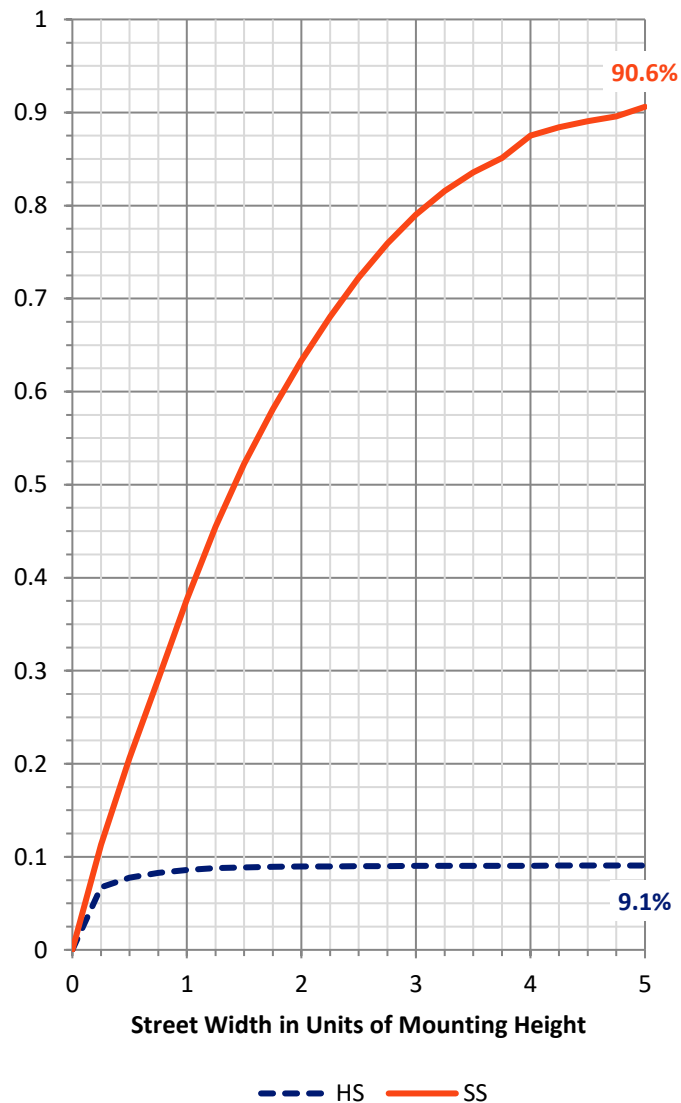
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 2201.6   | 0.0    | 2201.6  |
|                    | % Fixture | 9.1      | 0.0    | 9.1     |
| <b>Street Side</b> | Lumens    | 21951.4  | 0.0    | 21951.4 |
|                    | % Fixture | 90.9     | 0.0    | 90.9    |
| <b>Total</b>       | Lumens    | 24153.0  | 0.0    | 24153.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 344.6   | 1.4       |
| 10°-20°   | 748.1   | 3.1       |
| 20°-30°   | 1120.9  | 4.6       |
| 30°-40°   | 1783.4  | 7.4       |
| 40°-50°   | 3184.6  | 13.2      |
| 50°-60°   | 4941.6  | 20.5      |
| 60°-70°   | 6569.2  | 27.2      |
| 70°-80°   | 4941.4  | 20.5      |
| 80°-90°   | 519.2   | 2.1       |
| 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°    | 24153.0 | 100.0     |
| 0°-180°   | 24153.0 | 100.0     |

**Coefficient of Utilization**



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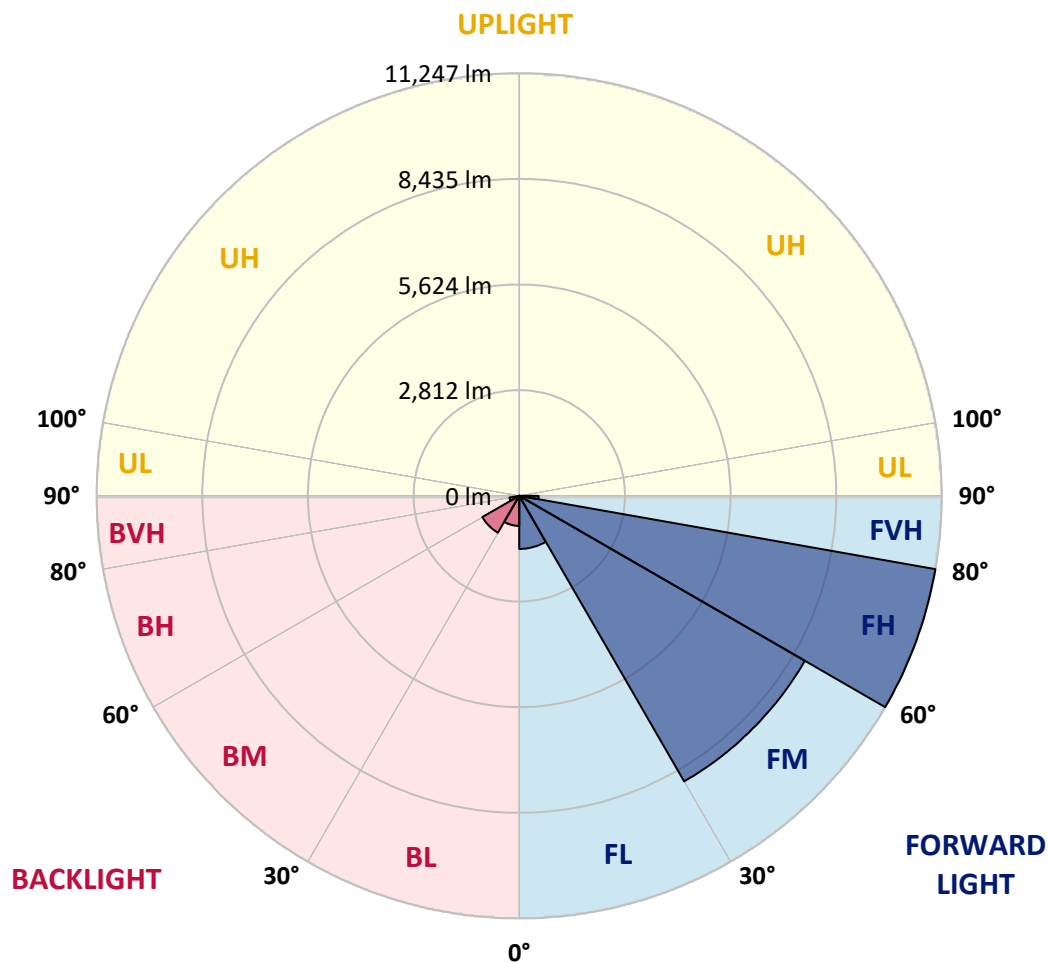
CATALOG NUMBER: GLEON-SA8A-730-U-T4FT-HSS

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

| Zone |             | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |          |
|------|-------------|---------|-----------|-------------------------|------|----------|
|      |             |         |           | B                       | U    | G        |
| FL   | (0°-30°)    | 1413.0  | 5.9       |                         |      |          |
| FM   | (30°-60°)   | 8776.4  | 36.3      |                         |      |          |
| FH   | (60°-80°)   | 11247.2 | 46.6      |                         |      | G4/12000 |
| FVH  | (80°-90°)   | 514.9   | 2.1       |                         |      | G4/750   |
| BL   | (0°-30°)    | 800.6   | 3.3       | B2/1000                 |      |          |
| BM   | (30°-60°)   | 1133.2  | 4.7       | B2/2500                 |      |          |
| BH   | (60°-80°)   | 263.4   | 1.1       | B1/500                  |      | G1/500   |
| BVH  | (80°-90°)   | 4.4     | 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 IV Short



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 31°     | 35°     | 45°     | 55°     | 65°     | 75°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 4155.6  | 4155.6  | 4155.6  | 4155.6  | 4155.6  | 4155.6  | 4155.6  | 4155.6  | 4155.6  | 4155.6  | 4155.6  |
| 2.5°  | 3938.1  | 3954.6  | 3972.4  | 3975.9  | 4005.5  | 4006.7  | 4049.2  | 4081.1  | 4113.0  | 4143.8  | 4154.4  |
| 5°    | 3533.9  | 3561.1  | 3593.0  | 3624.9  | 3687.5  | 3712.4  | 3816.4  | 3922.7  | 4024.4  | 4121.3  | 4168.6  |
| 7.5°  | 3102.5  | 3133.2  | 3178.1  | 3257.3  | 3327.1  | 3375.5  | 3539.8  | 3728.9  | 3918.0  | 4096.5  | 4199.3  |
| 10°   | 2708.9  | 2737.3  | 2784.6  | 2868.5  | 2976.0  | 3042.2  | 3263.2  | 3525.6  | 3803.4  | 4074.0  | 4245.4  |
| 12.5° | 2458.4  | 2473.7  | 2499.7  | 2589.6  | 2686.5  | 2760.9  | 3020.9  | 3346.0  | 3708.8  | 4072.8  | 4319.9  |
| 15°   | 2412.3  | 2417.0  | 2395.7  | 2435.9  | 2511.5  | 2583.6  | 2847.2  | 3200.6  | 3636.7  | 4091.8  | 4416.8  |
| 17.5° | 2485.5  | 2483.2  | 2412.3  | 2407.5  | 2467.8  | 2526.9  | 2762.1  | 3100.1  | 3585.9  | 4135.5  | 4542.1  |
| 20°   | 2596.6  | 2588.4  | 2465.5  | 2443.0  | 2506.8  | 2562.4  | 2756.2  | 3062.3  | 3567.0  | 4208.8  | 4694.5  |
| 22.5° | 2744.4  | 2730.2  | 2537.5  | 2513.9  | 2582.5  | 2640.4  | 2829.5  | 3099.0  | 3583.5  | 4306.9  | 4871.8  |
| 25°   | 2927.6  | 2906.3  | 2661.6  | 2635.6  | 2705.4  | 2763.3  | 2960.7  | 3204.1  | 3633.2  | 4426.2  | 5096.4  |
| 27.5° | 3134.4  | 3103.7  | 2860.2  | 2792.8  | 2872.0  | 2932.3  | 3135.6  | 3364.9  | 3711.2  | 4552.7  | 5371.8  |
| 30°   | 3329.4  | 3289.2  | 3069.4  | 2958.3  | 3055.2  | 3122.6  | 3324.7  | 3556.3  | 3836.5  | 4747.7  | 5748.8  |
| 32.5° | 3525.6  | 3480.7  | 3256.1  | 3123.8  | 3211.2  | 3284.5  | 3519.7  | 3819.9  | 4071.7  | 5045.5  | 6249.9  |
| 35°   | 3977.1  | 3929.8  | 3654.4  | 3435.8  | 3434.6  | 3476.0  | 3792.7  | 4180.4  | 4382.5  | 5460.4  | 6847.9  |
| 37.5° | 4737.1  | 4709.9  | 4447.5  | 4032.7  | 3921.6  | 3875.5  | 4165.0  | 4610.6  | 4829.3  | 6031.3  | 7522.8  |
| 40°   | 5569.1  | 5545.5  | 5251.2  | 4875.4  | 4706.3  | 4592.9  | 4699.2  | 5209.8  | 5460.4  | 6728.6  | 8211.9  |
| 42.5° | 6508.7  | 6396.5  | 5871.7  | 5759.4  | 5608.1  | 5521.9  | 5426.1  | 5948.5  | 6235.7  | 7487.4  | 8895.0  |
| 45°   | 7362.1  | 7173.0  | 6492.2  | 6322.0  | 6287.7  | 6309.0  | 6362.2  | 6941.3  | 7108.0  | 8389.2  | 9575.8  |
| 47.5° | 7870.3  | 7721.4  | 7199.0  | 7035.9  | 7026.4  | 7167.1  | 7568.9  | 8062.9  | 7976.7  | 9175.1  | 10175.0 |
| 50°   | 8353.7  | 8219.0  | 7785.2  | 7825.4  | 7869.1  | 8060.6  | 8938.7  | 9216.5  | 8769.7  | 9887.8  | 10724.6 |
| 52.5° | 8744.9  | 8539.3  | 8312.3  | 8538.1  | 8753.2  | 9061.7  | 10352.3 | 10251.8 | 9332.3  | 10455.1 | 11195.0 |
| 55°   | 8970.6  | 8877.3  | 8987.2  | 9214.1  | 9618.3  | 10119.5 | 11686.7 | 11113.4 | 9743.6  | 10972.8 | 11508.2 |
| 57.5° | 9798.0  | 9614.8  | 9833.4  | 10029.6 | 10556.8 | 11257.6 | 12829.6 | 11755.2 | 10040.3 | 11293.1 | 11580.3 |
| 60°   | 10799.1 | 10651.3 | 10780.1 | 11106.3 | 11817.9 | 12641.6 | 13898.0 | 12278.8 | 10195.1 | 11498.7 | 11393.6 |
| 62.5° | 12392.3 | 12197.2 | 12116.9 | 12482.1 | 13425.2 | 14324.7 | 14708.8 | 12641.6 | 10160.8 | 11407.7 | 10753.0 |
| 65°   | 14526.8 | 14324.7 | 13965.4 | 14296.3 | 15495.9 | 16130.6 | 15615.3 | 12718.5 | 9924.4  | 10671.4 | 9133.8  |
| 67.5° | 16713.3 | 16566.7 | 16259.4 | 16817.3 | 17899.9 | 18104.4 | 16573.8 | 12531.7 | 9163.3  | 8652.7  | 6453.2  |
| 70°   | 18157.6 | 18094.9 | 18294.7 | 19528.6 | 20494.2 | 20435.1 | 17453.2 | 11528.3 | 7142.2  | 5320.9  | 3192.3  |
| 72.5° | 17116.3 | 17416.5 | 18891.5 | 21128.9 | 22308.4 | 21826.2 | 17001.7 | 8852.5  | 4082.3  | 2047.1  | 923.1   |
| 73°   | 16253.5 | 16637.7 | 18623.3 | 21189.2 | 22451.4 | 21923.1 | 16622.3 | 8125.6  | 3479.5  | 1615.7  | 699.7   |
| 75°   | 11307.3 | 11778.9 | 15417.9 | 19734.2 | 21782.5 | 20887.8 | 13855.5 | 4973.5  | 1612.1  | 716.2   | 282.5   |
| 77.5° | 5489.9  | 5838.6  | 8489.6  | 14258.5 | 16940.2 | 16319.7 | 8625.5  | 1853.2  | 728.1   | 447.9   | 130.0   |
| 80°   | 2049.4  | 2278.7  | 3685.2  | 7256.9  | 9789.7  | 10046.2 | 3793.9  | 700.9   | 484.6   | 360.5   | 66.2    |
| 82.5° | 536.6   | 598.0   | 1359.2  | 3236.1  | 5017.2  | 5251.2  | 1196.1  | 353.4   | 354.6   | 296.7   | 40.2    |
| 85°   | 171.4   | 196.2   | 424.3   | 1452.6  | 2363.8  | 2075.4  | 312.0   | 171.4   | 257.7   | 221.0   | 22.5    |
| 87.5° | 21.3    | 27.2    | 134.7   | 341.6   | 521.2   | 289.6   | 48.5    | 50.8    | 109.9   | 122.9   | 13.0    |
| 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: P322512

CATALOG NUMBER: GLEON-SA8A-730-U-T4FT-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 4155.6 | 4155.6 | 4155.6 | 4155.6 | 4155.6 | 4155.6 | 4155.6 | 4155.6 | 4155.6 | 4155.6 | 4155.6 |
| 2.5°  | 4165.0 | 4159.1 | 4160.3 | 4129.6 | 4109.5 | 4069.3 | 4027.9 | 4009.0 | 3988.9 | 3980.7 | 3988.9 |
| 5°    | 4186.3 | 4175.7 | 4144.9 | 4050.4 | 3949.9 | 3819.9 | 3698.2 | 3606.0 | 3490.2 | 3458.2 | 3491.3 |
| 7.5°  | 4219.4 | 4198.1 | 4108.3 | 3915.6 | 3692.3 | 3444.1 | 3165.1 | 2961.9 | 2795.2 | 2687.6 | 2726.7 |
| 10°   | 4267.9 | 4227.7 | 4046.8 | 3719.5 | 3320.0 | 2880.3 | 2484.4 | 2175.9 | 1957.2 | 1867.4 | 1863.9 |
| 12.5° | 4349.4 | 4273.8 | 3971.2 | 3464.2 | 2864.9 | 2278.7 | 1759.9 | 1425.4 | 1248.1 | 1133.4 | 1131.1 |
| 15°   | 4439.2 | 4328.1 | 3875.5 | 3158.0 | 2335.4 | 1632.2 | 1133.4 | 879.3  | 764.7  | 728.1  | 723.3  |
| 17.5° | 4549.1 | 4390.8 | 3751.4 | 2781.0 | 1781.1 | 1081.4 | 739.9  | 666.6  | 661.9  | 658.3  | 658.3  |
| 20°   | 4687.4 | 4465.2 | 3591.8 | 2349.6 | 1263.5 | 722.1  | 628.8  | 633.5  | 635.9  | 631.1  | 632.3  |
| 22.5° | 4848.2 | 4540.9 | 3401.5 | 1886.3 | 854.5  | 604.0  | 601.6  | 607.5  | 609.9  | 607.5  | 608.7  |
| 25°   | 5034.9 | 4628.3 | 3169.9 | 1400.6 | 617.0  | 573.2  | 579.1  | 587.4  | 593.3  | 593.3  | 593.3  |
| 27.5° | 5266.6 | 4734.7 | 2890.9 | 977.4  | 533.0  | 541.3  | 557.9  | 573.2  | 581.5  | 583.9  | 583.9  |
| 30°   | 5567.9 | 4867.1 | 2556.5 | 670.1  | 484.6  | 498.8  | 529.5  | 559.0  | 574.4  | 576.8  | 578.0  |
| 32.5° | 5948.5 | 5016.0 | 2168.8 | 495.2  | 443.2  | 453.9  | 486.9  | 536.6  | 566.1  | 570.9  | 570.9  |
| 35°   | 6384.6 | 5188.6 | 1751.6 | 431.4  | 413.7  | 417.2  | 443.2  | 499.9  | 551.9  | 564.9  | 566.1  |
| 37.5° | 6862.1 | 5358.8 | 1332.0 | 403.0  | 388.8  | 388.8  | 407.8  | 456.2  | 517.7  | 557.9  | 562.6  |
| 40°   | 7307.7 | 5461.6 | 933.7  | 380.6  | 366.4  | 366.4  | 382.9  | 418.4  | 476.3  | 536.6  | 549.6  |
| 42.5° | 7719.0 | 5497.0 | 650.0  | 359.3  | 345.1  | 348.7  | 362.8  | 391.2  | 434.9  | 495.2  | 507.0  |
| 45°   | 8142.1 | 5491.1 | 473.9  | 334.5  | 323.8  | 334.5  | 345.1  | 366.4  | 398.3  | 432.6  | 434.9  |
| 47.5° | 8461.2 | 5441.5 | 375.8  | 310.8  | 303.7  | 317.9  | 327.4  | 341.6  | 359.3  | 356.9  | 356.9  |
| 50°   | 8760.3 | 5320.9 | 302.6  | 278.9  | 283.7  | 300.2  | 304.9  | 309.7  | 310.8  | 288.4  | 286.0  |
| 52.5° | 8987.2 | 5133.0 | 242.3  | 244.7  | 263.6  | 280.1  | 275.4  | 268.3  | 256.5  | 229.3  | 224.6  |
| 55°   | 9062.8 | 4771.3 | 190.3  | 202.1  | 234.0  | 255.3  | 237.6  | 222.2  | 199.7  | 177.3  | 172.6  |
| 57.5° | 8925.7 | 4304.5 | 154.8  | 157.2  | 197.4  | 215.1  | 195.0  | 177.3  | 152.5  | 133.6  | 130.0  |
| 60°   | 8635.0 | 3785.6 | 127.6  | 118.2  | 152.5  | 167.8  | 154.8  | 137.1  | 114.6  | 100.5  | 99.3   |
| 62.5° | 8058.2 | 3232.5 | 105.2  | 92.2   | 115.8  | 128.8  | 120.6  | 107.6  | 88.6   | 79.2   | 78.0   |
| 65°   | 6845.6 | 2586.0 | 85.1   | 74.5   | 89.8   | 100.5  | 93.4   | 83.9   | 69.7   | 62.6   | 61.5   |
| 67.5° | 4778.4 | 1748.0 | 69.7   | 61.5   | 70.9   | 79.2   | 73.3   | 68.6   | 55.5   | 54.4   | 55.5   |
| 70°   | 2304.7 | 842.7  | 57.9   | 49.6   | 55.5   | 61.5   | 59.1   | 55.5   | 53.2   | 61.5   | 70.9   |
| 72.5° | 660.7  | 282.5  | 46.1   | 41.4   | 44.9   | 48.5   | 50.8   | 49.6   | 57.9   | 74.5   | 86.3   |
| 73°   | 508.2  | 228.1  | 43.7   | 39.0   | 42.5   | 47.3   | 49.6   | 48.5   | 59.1   | 75.6   | 86.3   |
| 75°   | 217.5  | 109.9  | 33.1   | 31.9   | 35.5   | 41.4   | 43.7   | 43.7   | 59.1   | 76.8   | 82.7   |
| 77.5° | 98.1   | 59.1   | 21.3   | 24.8   | 30.7   | 33.1   | 36.6   | 36.6   | 47.3   | 59.1   | 59.1   |
| 80°   | 55.5   | 31.9   | 16.5   | 18.9   | 22.5   | 22.5   | 22.5   | 20.1   | 21.3   | 23.6   | 26.0   |
| 82.5° | 35.5   | 21.3   | 13.0   | 15.4   | 14.2   | 11.8   | 9.5    | 9.5    | 8.3    | 9.5    | 11.8   |
| 85°   | 20.1   | 11.8   | 11.8   | 9.5    | 5.9    | 4.7    | 5.9    | 4.7    | 1.2    | 0.0    | 1.2    |
| 87.5° | 11.8   | 7.1    | 3.5    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |



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

Report Prepared for

Cooper Lighting Solutions

McGRAW-EDISON

Report Number: SP1-1908-441-2-R4

Test Date: 10/03/2019

Luminaire Tested: SA1C-730-U-5WQ

Data in this report applies to families of products SA1C-730-U-5WQ .

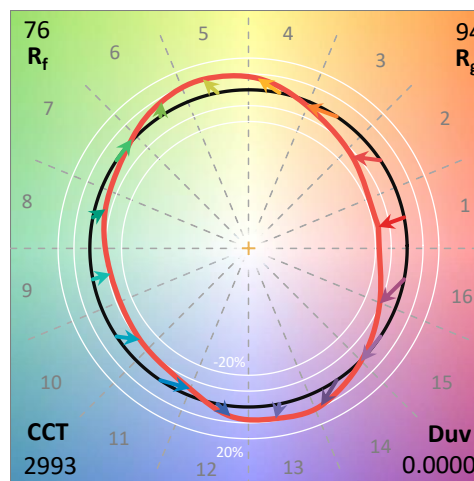
### Test Information

Test Method: LM-79-2008  
Report Number: SP1-1908-441-2-R4  
Test Lab: COOPER LIGHTING SOLUTIONS  
Photometer: SP1 - 76IN SPHERE  
Measurement Geometry:  $4\pi$   
Issue Date: 10/28/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: MCGRAW-EDISON  
Catalog Number: **SA1C-730-U-5WQ**  
Description: MCGRAW EDISON ROADWAY AND AREA LUMINAIRE

\*\*\*THIS IS A REVISION OF SP1-1908-441-2-R3. TO UPDATE THE CATALOG INFORMATION.\*\*\*TESTED IN SITU. (1) 70 CRI, 3000K, 1050MA LIGHTSQUARE WITH 16 LEDS AND TYPE V WIDE OPTICS.

### Spectral Parameters

|                           |        |           |      |      |       |
|---------------------------|--------|-----------|------|------|-------|
| CCT (K):                  | 2993   | CRI (Ra): | 71.8 |      |       |
| CIE u':                   | 0.2508 | R1:       | 67.5 | R9:  | -38.3 |
| CIE v':                   | 0.5215 | R2:       | 82.9 | R10: | 62.5  |
| Duv:                      | 0.0000 | R3:       | 94.7 | R11: | 63.7  |
| CIE x:                    | 0.4374 | R4:       | 67.7 | R12: | 57.8  |
| CIE y:                    | 0.4043 | R5:       | 67.9 | R13: | 70.4  |
| CIE z:                    | 0.1583 | R6:       | 77.6 | R14: | 97.3  |
| Peak Wavelength (nm):     | 593    | R7:       | 76.0 |      |       |
| Dominant Wavelength (nm): | 582    | R8:       | 40.5 |      |       |
| Purity:                   | 53     |           |      |      |       |
| Rf:                       | 75.7   |           |      |      |       |
| Rg:                       | 93.9   |           |      |      |       |



### Test Conditions

Stabilization Time: 53M  
Operation Time: 12H  
Room Temperature (°C) / RH%: 25.0./44%  
Sphere Temperature (°C): 25.7

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| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | IN0058                | 6/28/2019        | 12/28/2019           |
| Power Meter                    | IN0071                | 12/5/2018        | 12/5/2019            |
| AC Power Source                | IN0063                | 12/5/2018        | 12/5/2019            |
| DC Power Source                | IN0208                | 12/5/2018        | 12/5/2019            |
| Sphere Thermometer             | IN0085                | 12/5/2018        | 12/5/2019            |
| Room Thermometer               | IN0046                | 12/5/2018        | 12/5/2019            |

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CIE 1931 Chromaticity Diagram



CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles



Point lies inside the ANSI 3000K 4-step quadrangle

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**Photopic Flux vs. Wavelength**



#####

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 2397             | NR               | 490       | 24908            | NR               | 620       | 118784           | NR               | 750       | 5037             | NR               | 880       | 2677             | NR               |
| 365       | 2084             | NR               | 495       | 30998            | NR               | 625       | 108951           | NR               | 755       | 4413             | NR               | 885       | 2940             | NR               |
| 370       | 2143             | NR               | 500       | 37103            | NR               | 630       | 99573            | NR               | 760       | 4189             | NR               | 890       | 3116             | NR               |
| 375       | 2413             | NR               | 505       | 42987            | NR               | 635       | 90444            | NR               | 765       | 3677             | NR               | 895       | 3345             | NR               |
| 380       | 2172             | NR               | 510       | 48702            | NR               | 640       | 80749            | NR               | 770       | 3366             | NR               | 900       | 2312             | NR               |
| 385       | 1997             | NR               | 515       | 53741            | NR               | 645       | 71664            | NR               | 775       | 3211             | NR               | 905       | 2829             | NR               |
| 390       | 1830             | NR               | 520       | 57283            | NR               | 650       | 63936            | NR               | 780       | 2682             | NR               | 910       | 2783             | NR               |
| 395       | 1861             | NR               | 525       | 61876            | NR               | 655       | 56611            | NR               | 785       | 2804             | NR               | 915       | 2662             | NR               |
| 400       | 1717             | NR               | 530       | 65398            | NR               | 660       | 49763            | NR               | 790       | 2581             | NR               | 920       | 3047             | NR               |
| 405       | 1761             | NR               | 535       | 69597            | NR               | 665       | 42891            | NR               | 795       | 2711             | NR               | 925       | 2256             | NR               |
| 410       | 2680             | NR               | 540       | 74214            | NR               | 670       | 36939            | NR               | 800       | 2609             | NR               | 930       | 2976             | NR               |
| 415       | 4374             | NR               | 545       | 79911            | NR               | 675       | 31946            | NR               | 805       | 2581             | NR               | 935       | 3503             | NR               |
| 420       | 8071             | NR               | 550       | 86153            | NR               | 680       | 27385            | NR               | 810       | 2404             | NR               | 940       | 4226             | NR               |
| 425       | 15169            | NR               | 555       | 93952            | NR               | 685       | 23504            | NR               | 815       | 2556             | NR               | 945       | 2930             | NR               |
| 430       | 26038            | NR               | 560       | 102904           | NR               | 690       | 20210            | NR               | 820       | 2742             | NR               | 950       | 2115             | NR               |
| 435       | 41316            | NR               | 565       | 112009           | NR               | 695       | 17459            | NR               | 825       | 2014             | NR               | 955       | 2634             | NR               |
| 440       | 59674            | NR               | 570       | 121662           | NR               | 700       | 15207            | NR               | 830       | 2488             | NR               | 960       | 4200             | NR               |
| 445       | 72751            | NR               | 575       | 130476           | NR               | 705       | 13322            | NR               | 835       | 2625             | NR               | 965       | 1982             | NR               |
| 450       | 65091            | NR               | 580       | 137926           | NR               | 710       | 11676            | NR               | 840       | 2754             | NR               | 970       | 3613             | NR               |
| 455       | 44894            | NR               | 585       | 143406           | NR               | 715       | 10626            | NR               | 845       | 2708             | NR               | 975       | 4034             | NR               |
| 460       | 32712            | NR               | 590       | 147039           | NR               | 720       | 9416             | NR               | 850       | 2608             | NR               | 980       | 3922             | NR               |
| 465       | 25296            | NR               | 595       | 147365           | NR               | 725       | 8333             | NR               | 855       | 2605             | NR               | 985       | 1909             | NR               |
| 470       | 19318            | NR               | 600       | 145800           | NR               | 730       | 7134             | NR               | 860       | 1765             | NR               | 990       | 3617             | NR               |
| 475       | 17265            | NR               | 605       | 141363           | NR               | 735       | 6437             | NR               | 865       | 2581             | NR               | 995       | 4767             | NR               |
| 480       | 18260            | NR               | 610       | 134199           | NR               | 740       | 5834             | NR               | 870       | 3016             | NR               | 1000      | 2528             | NR               |
| 485       | 20845            | NR               | 615       | 127683           | NR               | 745       | 5500             | NR               | 875       | 3952             | NR               |           |                  |                  |

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Scotopic Flux vs. Wavelength



Scotopic Lumens: 8494.8

S/P: 1.23

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 2397             | NR               | 490       | 24908            | NR               | 620       | 118784           | NR               | 750       | 5037             | NR               | 880       | 2677             | NR               |
| 365       | 2084             | NR               | 495       | 30998            | NR               | 625       | 108951           | NR               | 755       | 4413             | NR               | 885       | 2940             | NR               |
| 370       | 2143             | NR               | 500       | 37103            | NR               | 630       | 99573            | NR               | 760       | 4189             | NR               | 890       | 3116             | NR               |
| 375       | 2413             | NR               | 505       | 42987            | NR               | 635       | 90444            | NR               | 765       | 3677             | NR               | 895       | 3345             | NR               |
| 380       | 2172             | NR               | 510       | 48702            | NR               | 640       | 80749            | NR               | 770       | 3366             | NR               | 900       | 2312             | NR               |
| 385       | 1997             | NR               | 515       | 53741            | NR               | 645       | 71664            | NR               | 775       | 3211             | NR               | 905       | 2829             | NR               |
| 390       | 1830             | NR               | 520       | 57283            | NR               | 650       | 63936            | NR               | 780       | 2682             | NR               | 910       | 2783             | NR               |
| 395       | 1861             | NR               | 525       | 61876            | NR               | 655       | 56611            | NR               | 785       | 2804             | NR               | 915       | 2662             | NR               |
| 400       | 1717             | NR               | 530       | 65398            | NR               | 660       | 49763            | NR               | 790       | 2581             | NR               | 920       | 3047             | NR               |
| 405       | 1761             | NR               | 535       | 69597            | NR               | 665       | 42891            | NR               | 795       | 2711             | NR               | 925       | 2256             | NR               |
| 410       | 2680             | NR               | 540       | 74214            | NR               | 670       | 36939            | NR               | 800       | 2609             | NR               | 930       | 2976             | NR               |
| 415       | 4374             | NR               | 545       | 79911            | NR               | 675       | 31946            | NR               | 805       | 2581             | NR               | 935       | 3503             | NR               |
| 420       | 8071             | NR               | 550       | 86153            | NR               | 680       | 27385            | NR               | 810       | 2404             | NR               | 940       | 4226             | NR               |
| 425       | 15169            | NR               | 555       | 93952            | NR               | 685       | 23504            | NR               | 815       | 2556             | NR               | 945       | 2930             | NR               |
| 430       | 26038            | NR               | 560       | 102904           | NR               | 690       | 20210            | NR               | 820       | 2742             | NR               | 950       | 2115             | NR               |
| 435       | 41316            | NR               | 565       | 112009           | NR               | 695       | 17459            | NR               | 825       | 2014             | NR               | 955       | 2634             | NR               |
| 440       | 59674            | NR               | 570       | 121662           | NR               | 700       | 15207            | NR               | 830       | 2488             | NR               | 960       | 4200             | NR               |
| 445       | 72751            | NR               | 575       | 130476           | NR               | 705       | 13322            | NR               | 835       | 2625             | NR               | 965       | 1982             | NR               |
| 450       | 65091            | NR               | 580       | 137926           | NR               | 710       | 11676            | NR               | 840       | 2754             | NR               | 970       | 3613             | NR               |
| 455       | 44894            | NR               | 585       | 143406           | NR               | 715       | 10626            | NR               | 845       | 2708             | NR               | 975       | 4034             | NR               |
| 460       | 32712            | NR               | 590       | 147039           | NR               | 720       | 9416             | NR               | 850       | 2608             | NR               | 980       | 3922             | NR               |
| 465       | 25296            | NR               | 595       | 147365           | NR               | 725       | 8333             | NR               | 855       | 2605             | NR               | 985       | 1909             | NR               |
| 470       | 19318            | NR               | 600       | 145800           | NR               | 730       | 7134             | NR               | 860       | 1765             | NR               | 990       | 3617             | NR               |
| 475       | 17265            | NR               | 605       | 141363           | NR               | 735       | 6437             | NR               | 865       | 2581             | NR               | 995       | 4767             | NR               |
| 480       | 18260            | NR               | 610       | 134199           | NR               | 740       | 5834             | NR               | 870       | 3016             | NR               | 1000      | 2528             | NR               |
| 485       | 20845            | NR               | 615       | 127683           | NR               | 745       | 5500             | NR               | 875       | 3952             | NR               |           |                  |                  |

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**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: 3101.5 M/P: 0.45**

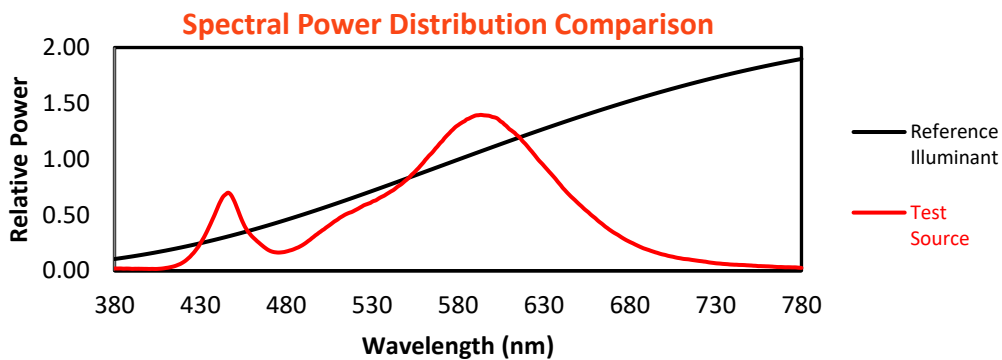
| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 2397             | NR               | 490       | 24908            | NR               | 620       | 118784           | NR               | 750       | 5037             | NR               | 880       | 2677             | NR               |
| 365       | 2084             | NR               | 495       | 30998            | NR               | 625       | 108951           | NR               | 755       | 4413             | NR               | 885       | 2940             | NR               |
| 370       | 2143             | NR               | 500       | 37103            | NR               | 630       | 99573            | NR               | 760       | 4189             | NR               | 890       | 3116             | NR               |
| 375       | 2413             | NR               | 505       | 42987            | NR               | 635       | 90444            | NR               | 765       | 3677             | NR               | 895       | 3345             | NR               |
| 380       | 2172             | NR               | 510       | 48702            | NR               | 640       | 80749            | NR               | 770       | 3366             | NR               | 900       | 2312             | NR               |
| 385       | 1997             | NR               | 515       | 53741            | NR               | 645       | 71664            | NR               | 775       | 3211             | NR               | 905       | 2829             | NR               |
| 390       | 1830             | NR               | 520       | 57283            | NR               | 650       | 63936            | NR               | 780       | 2682             | NR               | 910       | 2783             | NR               |
| 395       | 1861             | NR               | 525       | 61876            | NR               | 655       | 56611            | NR               | 785       | 2804             | NR               | 915       | 2662             | NR               |
| 400       | 1717             | NR               | 530       | 65398            | NR               | 660       | 49763            | NR               | 790       | 2581             | NR               | 920       | 3047             | NR               |
| 405       | 1761             | NR               | 535       | 69597            | NR               | 665       | 42891            | NR               | 795       | 2711             | NR               | 925       | 2256             | NR               |
| 410       | 2680             | NR               | 540       | 74214            | NR               | 670       | 36939            | NR               | 800       | 2609             | NR               | 930       | 2976             | NR               |
| 415       | 4374             | NR               | 545       | 79911            | NR               | 675       | 31946            | NR               | 805       | 2581             | NR               | 935       | 3503             | NR               |
| 420       | 8071             | NR               | 550       | 86153            | NR               | 680       | 27385            | NR               | 810       | 2404             | NR               | 940       | 4226             | NR               |
| 425       | 15169            | NR               | 555       | 93952            | NR               | 685       | 23504            | NR               | 815       | 2556             | NR               | 945       | 2930             | NR               |
| 430       | 26038            | NR               | 560       | 102904           | NR               | 690       | 20210            | NR               | 820       | 2742             | NR               | 950       | 2115             | NR               |
| 435       | 41316            | NR               | 565       | 112009           | NR               | 695       | 17459            | NR               | 825       | 2014             | NR               | 955       | 2634             | NR               |
| 440       | 59674            | NR               | 570       | 121662           | NR               | 700       | 15207            | NR               | 830       | 2488             | NR               | 960       | 4200             | NR               |
| 445       | 72751            | NR               | 575       | 130476           | NR               | 705       | 13322            | NR               | 835       | 2625             | NR               | 965       | 1982             | NR               |
| 450       | 65091            | NR               | 580       | 137926           | NR               | 710       | 11676            | NR               | 840       | 2754             | NR               | 970       | 3613             | NR               |
| 455       | 44894            | NR               | 585       | 143406           | NR               | 715       | 10626            | NR               | 845       | 2708             | NR               | 975       | 4034             | NR               |
| 460       | 32712            | NR               | 590       | 147039           | NR               | 720       | 9416             | NR               | 850       | 2608             | NR               | 980       | 3922             | NR               |
| 465       | 25296            | NR               | 595       | 147365           | NR               | 725       | 8333             | NR               | 855       | 2605             | NR               | 985       | 1909             | NR               |
| 470       | 19318            | NR               | 600       | 145800           | NR               | 730       | 7134             | NR               | 860       | 1765             | NR               | 990       | 3617             | NR               |
| 475       | 17265            | NR               | 605       | 141363           | NR               | 735       | 6437             | NR               | 865       | 2581             | NR               | 995       | 4767             | NR               |
| 480       | 18260            | NR               | 610       | 134199           | NR               | 740       | 5834             | NR               | 870       | 3016             | NR               | 1000      | 2528             | NR               |
| 485       | 20845            | NR               | 615       | 127683           | NR               | 745       | 5500             | NR               | 875       | 3952             | NR               |           |                  |                  |

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### Summary

$R_f = 75.7$   
 $R_g = 93.9$   
 CIE  $R_a = 71.8$   
 $R_g = -38.3$



### Color Vector Graphics





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

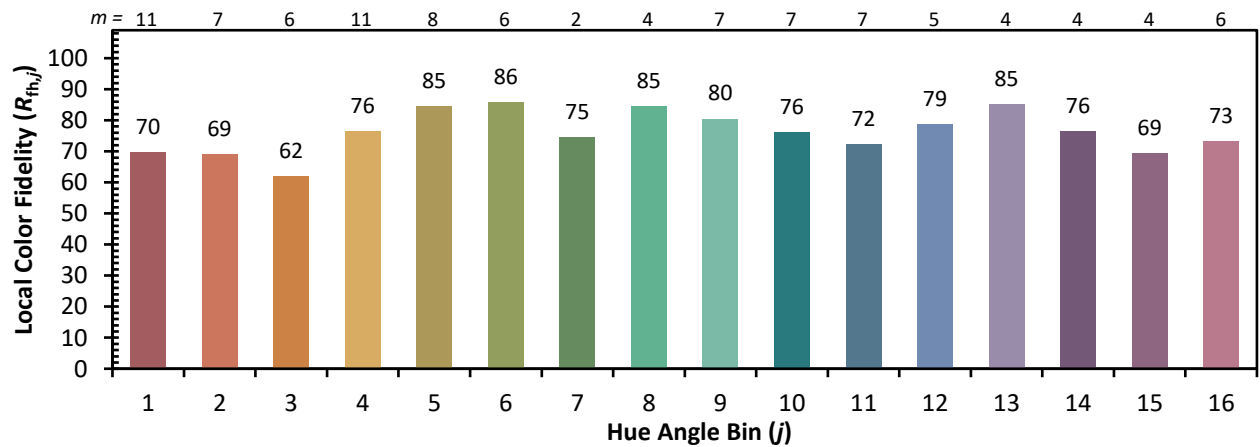
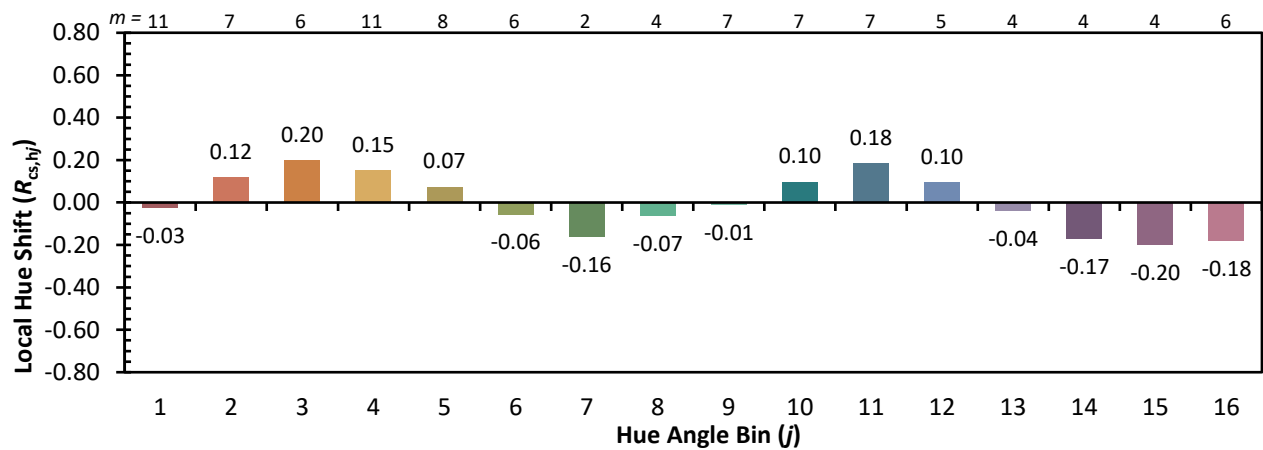
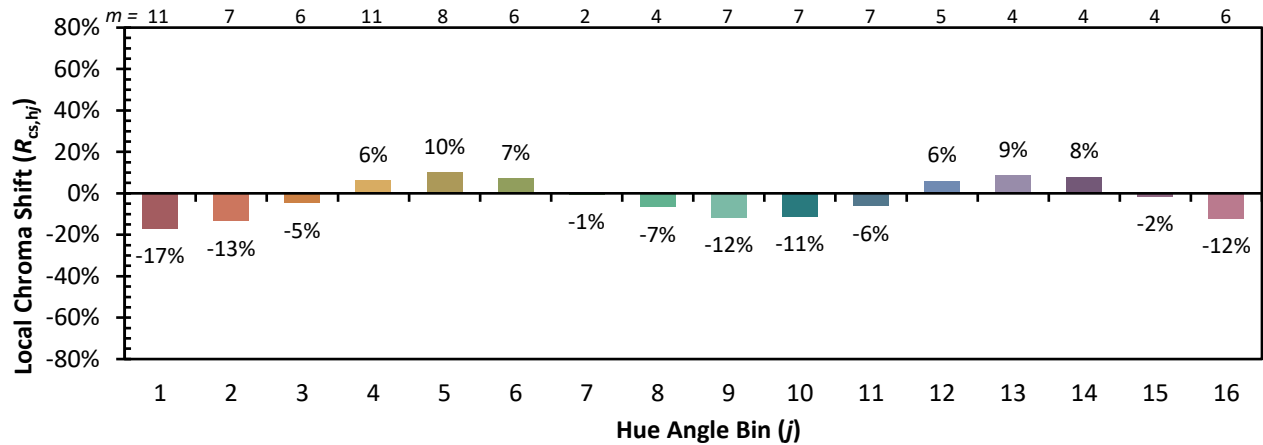
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|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 67 | CES51 = 87 | CES76 = 63 |
| CES02 = 63 | CES27 = 88 | CES52 = 86 | CES77 = 80 |
| CES03 = 31 | CES28 = 87 | CES53 = 78 | CES78 = 67 |
| CES04 = 71 | CES29 = 66 | CES54 = 84 | CES79 = 87 |
| CES05 = 49 | CES30 = 73 | CES55 = 84 | CES80 = 86 |
| CES06 = 51 | CES31 = 70 | CES56 = 75 | CES81 = 71 |
| CES07 = 41 | CES32 = 65 | CES57 = 74 | CES82 = 94 |
| CES08 = 40 | CES33 = 73 | CES58 = 76 | CES83 = 90 |
| CES09 = 29 | CES34 = 79 | CES59 = 85 | CES84 = 89 |
| CES10 = 76 | CES35 = 89 | CES60 = 93 | CES85 = 77 |
| CES11 = 59 | CES36 = 97 | CES61 = 84 | CES86 = 61 |
| CES12 = 65 | CES37 = 87 | CES62 = 91 | CES87 = 78 |
| CES13 = 43 | CES38 = 81 | CES63 = 77 | CES88 = 77 |
| CES14 = 74 | CES39 = 95 | CES64 = 72 | CES89 = 67 |
| CES15 = 71 | CES40 = 92 | CES65 = 68 | CES90 = 76 |
| CES16 = 47 | CES41 = 88 | CES66 = 69 | CES91 = 89 |
| CES17 = 50 | CES42 = 89 | CES67 = 67 | CES92 = 58 |
| CES18 = 56 | CES43 = 79 | CES68 = 72 | CES93 = 74 |
| CES19 = 73 | CES44 = 99 | CES69 = 81 | CES94 = 49 |
| CES20 = 66 | CES45 = 85 | CES70 = 66 | CES95 = 68 |
| CES21 = 87 | CES46 = 80 | CES71 = 67 | CES96 = 76 |
| CES22 = 79 | CES47 = 82 | CES72 = 88 | CES97 = 82 |
| CES23 = 92 | CES48 = 69 | CES73 = 59 | CES98 = 75 |
| CES24 = 91 | CES49 = 80 | CES74 = 95 | CES99 = 62 |
| CES25 = 73 | CES50 = 87 | CES75 = 69 |            |



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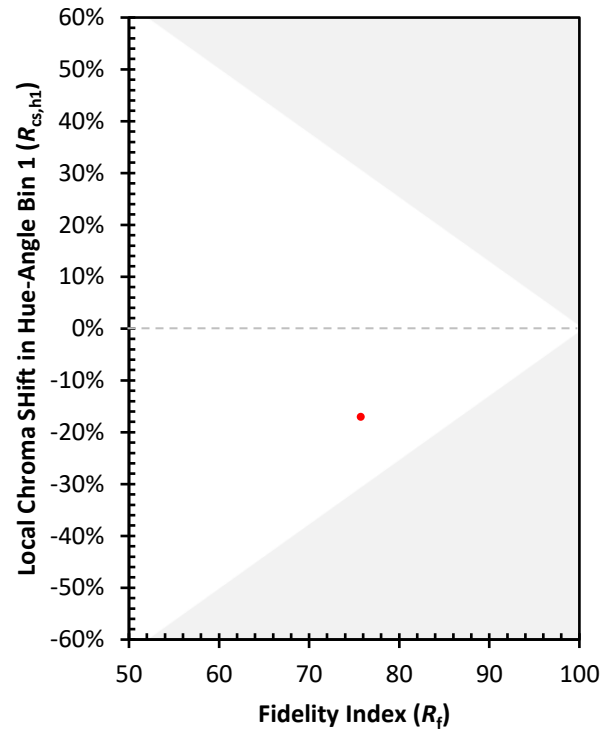
**Color Rendition by Hue-Angle Bin**



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**Measure Comparisons**



(END OF REPORT)