

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: P323840

Luminaire Tested: **GLEON-SA6B-740-U-SL4-HSS**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P323840  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-25)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA6B-740-U-SL4-HSS  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(6) 70 CRI, 4000K, 800mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE IV SPILL  
LIGHT ELIMINATOR OPTICS WITH HOUSE SIDE SHIELD  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 27741 lumens  
Efficiency: N/A  
Efficacy: 111.4 lumens/watt  
Luminous Opening: Rectangular (W 1.5' x L: 1' x H: 0')  
IES Classification: Type IV - Short  
BUG Rating: B2 - U0 - G4

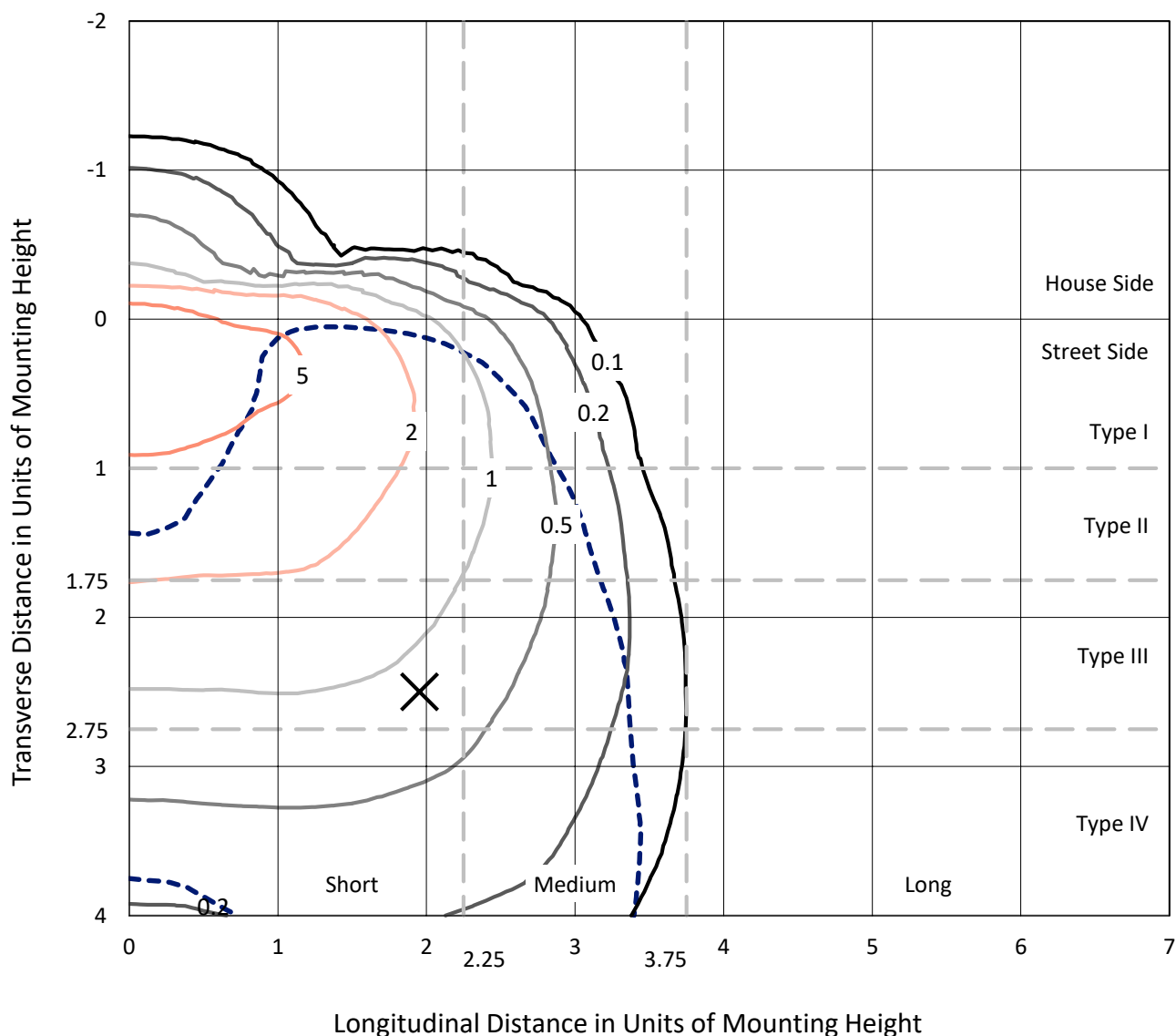
Input Watts (W): 249  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



REPORT NUMBER: P323840  
 CATALOG NUMBER: GLEON-SA6B-740-U-SL4-HSS

## Iso-Footcandle Lines of Horizontal Illumination

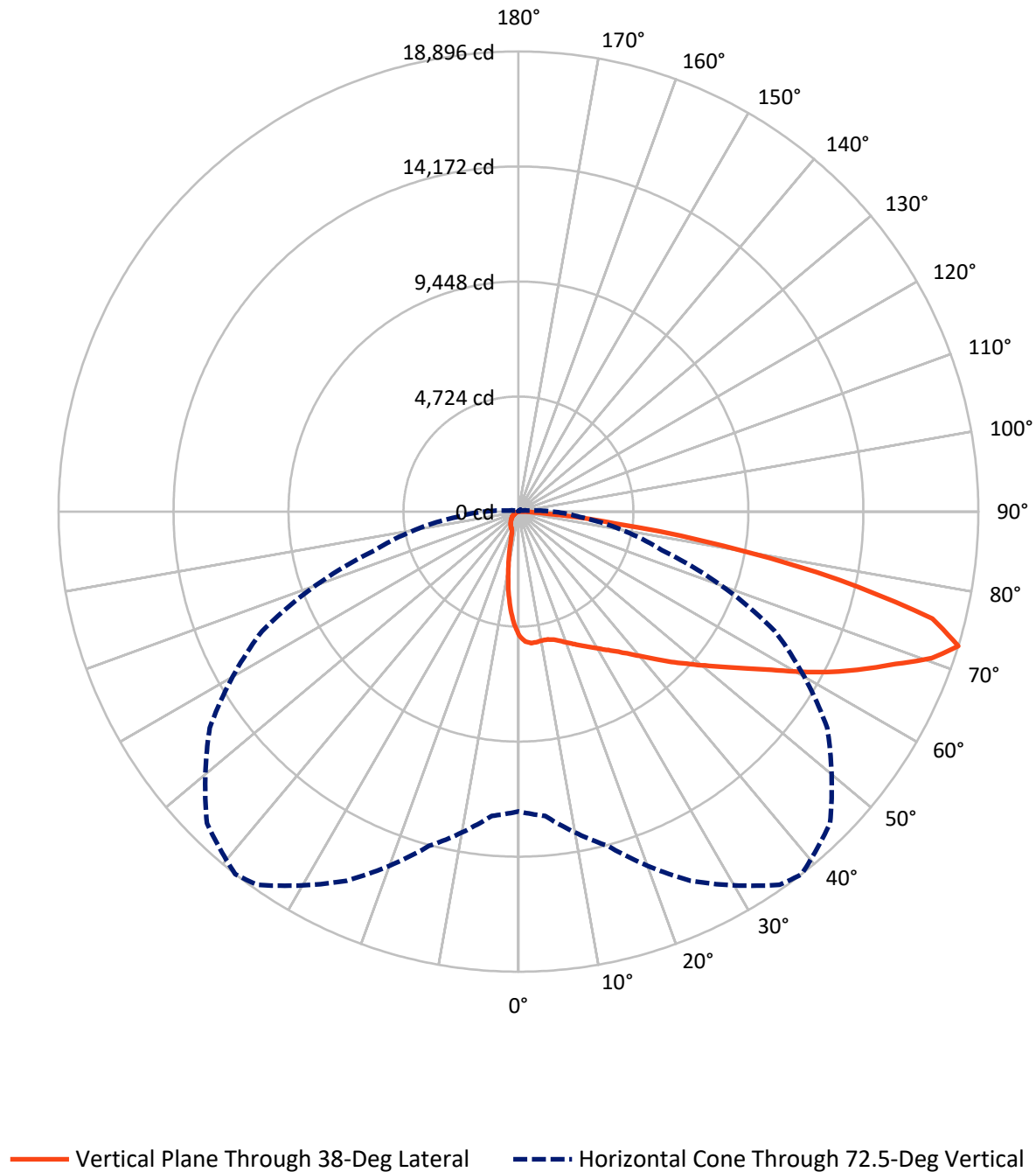
× Max cd  
 - - - 1/2 Max cd



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

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## Luminous Intensity Polar Plot



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**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 2334.5   | 0.0    | 2334.5  |
|                    | % Fixture | 8.4      | 0.0    | 8.4     |
| <b>Street Side</b> | Lumens    | 25406.5  | 0.0    | 25406.5 |
|                    | % Fixture | 91.6     | 0.0    | 91.6    |
| <b>Total</b>       | Lumens    | 27741.0  | 0.0    | 27741.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 434.7   | 1.6       |
| 10°-20°   | 1063.0  | 3.8       |
| 20°-30°   | 1690.8  | 6.1       |
| 30°-40°   | 2541.9  | 9.2       |
| 40°-50°   | 3877.8  | 14.0      |
| 50°-60°   | 5480.6  | 19.8      |
| 60°-70°   | 6874.5  | 24.8      |
| 70°-80°   | 5140.2  | 18.5      |
| 80°-90°   | 637.4   | 2.3       |
| 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°    | 27741.0 | 100.0     |
| 0°-180°   | 27741.0 | 100.0     |

**Coefficient of Utilization**



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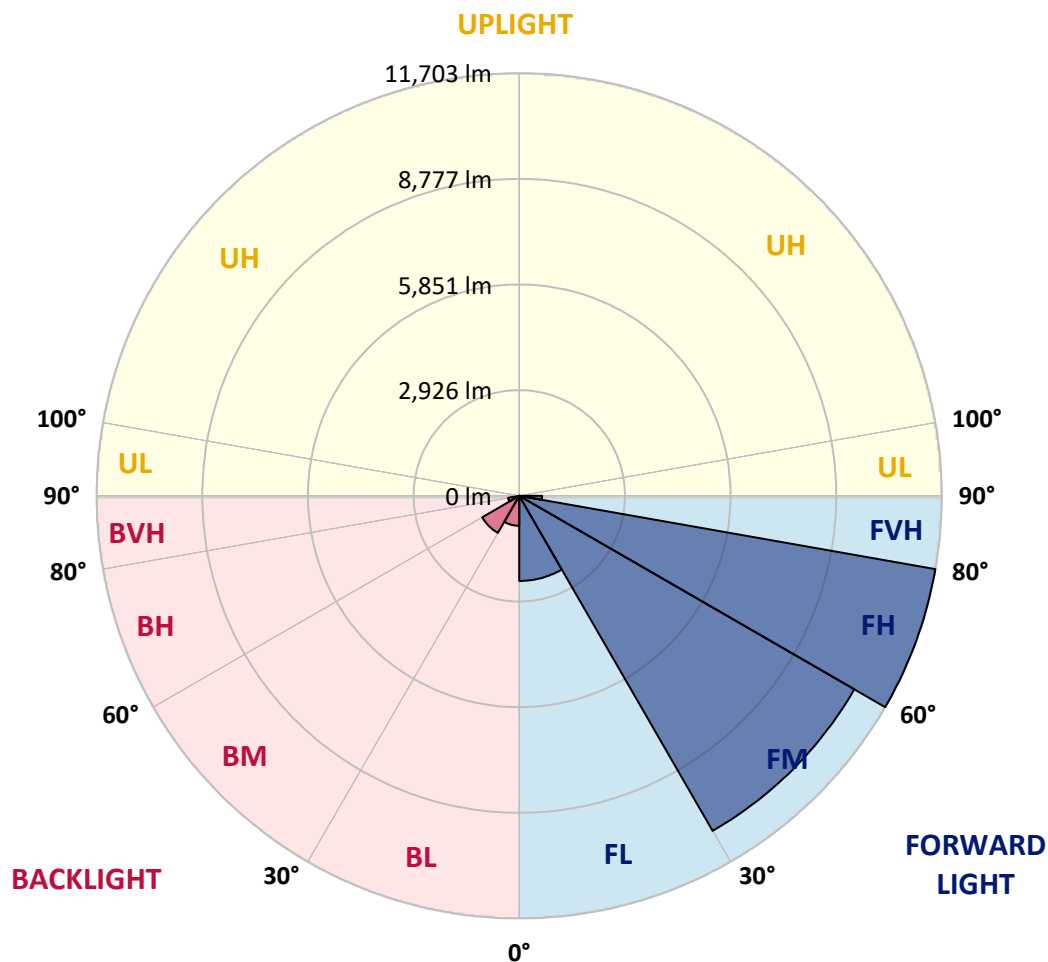
CATALOG NUMBER: GLEON-SA6B-740-U-SL4-HSS

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

| Zone |             | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |          |
|------|-------------|---------|-----------|-------------------------|------|----------|
|      |             |         |           | B                       | U    | G        |
| FL   | (0°-30°)    | 2357.3  | 8.5       |                         |      |          |
| FM   | (30°-60°)   | 10714.8 | 38.6      |                         |      |          |
| FH   | (60°-80°)   | 11702.9 | 42.2      |                         |      | G4/12000 |
| FVH  | (80°-90°)   | 631.4   | 2.3       |                         |      | G4/750   |
| BL   | (0°-30°)    | 831.2   | 3.0       | B2/1000                 |      |          |
| BM   | (30°-60°)   | 1185.5  | 4.3       | B2/2500                 |      |          |
| BH   | (60°-80°)   | 311.8   | 1.1       | B1/500                  |      | G1/500   |
| BVH  | (80°-90°)   | 5.9     | 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





REPORT NUMBER: P323840

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**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 38°     | 45°     | 55°     | 65°     | 75°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 5101.5  | 5101.5  | 5101.5  | 5101.5  | 5101.5  | 5101.5  | 5101.5  | 5101.5  | 5101.5  | 5101.5  | 5101.5  |
| 2.5°  | 5414.8  | 5416.0  | 5403.3  | 5382.6  | 5356.1  | 5342.3  | 5319.2  | 5282.4  | 5243.2  | 5172.9  | 5096.9  |
| 5°    | 5525.4  | 5525.4  | 5509.3  | 5481.7  | 5439.0  | 5426.4  | 5382.6  | 5323.8  | 5243.2  | 5129.1  | 5001.2  |
| 7.5°  | 5513.9  | 5516.2  | 5494.3  | 5465.5  | 5422.9  | 5411.4  | 5358.4  | 5292.7  | 5192.5  | 5054.2  | 4890.6  |
| 10°   | 5454.0  | 5459.8  | 5442.5  | 5428.7  | 5389.5  | 5376.8  | 5327.3  | 5261.6  | 5161.4  | 5013.9  | 4826.1  |
| 12.5° | 5393.0  | 5398.7  | 5404.5  | 5417.2  | 5393.0  | 5388.4  | 5349.2  | 5293.9  | 5198.3  | 5045.0  | 4833.0  |
| 15°   | 5353.8  | 5365.3  | 5406.8  | 5456.3  | 5462.1  | 5457.5  | 5432.1  | 5380.3  | 5283.5  | 5124.5  | 4882.6  |
| 17.5° | 5353.8  | 5372.2  | 5458.6  | 5553.1  | 5586.5  | 5590.0  | 5568.1  | 5495.5  | 5380.3  | 5209.8  | 4928.7  |
| 20°   | 5398.7  | 5424.1  | 5558.9  | 5692.5  | 5747.8  | 5747.8  | 5705.2  | 5603.8  | 5469.0  | 5287.0  | 4959.8  |
| 22.5° | 5513.9  | 5547.3  | 5716.7  | 5871.1  | 5929.8  | 5917.2  | 5859.6  | 5712.1  | 5561.2  | 5374.5  | 4998.9  |
| 25°   | 5740.9  | 5766.2  | 5942.5  | 6098.0  | 6133.8  | 6105.0  | 6032.4  | 5843.4  | 5678.7  | 5493.2  | 5070.4  |
| 27.5° | 6033.5  | 6037.0  | 6219.0  | 6350.3  | 6328.5  | 6308.9  | 6217.9  | 6008.2  | 5848.0  | 5662.5  | 5193.6  |
| 30°   | 6355.0  | 6355.0  | 6515.1  | 6615.3  | 6548.5  | 6532.4  | 6441.4  | 6207.5  | 6064.6  | 5893.0  | 5368.8  |
| 32.5° | 6666.0  | 6679.8  | 6810.0  | 6873.4  | 6798.5  | 6782.4  | 6693.7  | 6459.8  | 6352.7  | 6244.4  | 5641.8  |
| 35°   | 6966.7  | 6977.1  | 7100.4  | 7134.9  | 7063.5  | 7068.1  | 7004.7  | 6806.6  | 6766.3  | 6752.4  | 6053.1  |
| 37.5° | 7258.2  | 7260.5  | 7386.1  | 7408.0  | 7372.3  | 7411.4  | 7417.2  | 7242.1  | 7317.0  | 7428.7  | 6632.6  |
| 40°   | 7524.3  | 7526.6  | 7651.1  | 7707.5  | 7768.6  | 7819.3  | 7864.2  | 7770.9  | 8018.6  | 8277.8  | 7322.7  |
| 42.5° | 7737.5  | 7761.7  | 7919.5  | 8026.6  | 8187.9  | 8284.7  | 8406.8  | 8402.2  | 8853.9  | 9243.3  | 8156.8  |
| 45°   | 7925.3  | 7966.7  | 8186.8  | 8374.6  | 8651.1  | 8805.5  | 8996.7  | 9146.5  | 9794.0  | 10318.2 | 9001.3  |
| 47.5° | 8173.0  | 8212.1  | 8463.3  | 8770.9  | 9139.6  | 9342.3  | 9659.2  | 9982.9  | 10827.4 | 11373.5 | 9826.2  |
| 50°   | 8522.0  | 8504.8  | 8752.5  | 9193.7  | 9667.2  | 9933.4  | 10385.0 | 10870.0 | 11852.8 | 12292.9 | 10311.3 |
| 52.5° | 8894.2  | 8887.3  | 9070.4  | 9653.4  | 10289.4 | 10600.4 | 11197.2 | 11787.1 | 12833.2 | 12926.5 | 10533.6 |
| 55°   | 9355.0  | 9305.5  | 9459.9  | 10177.6 | 11027.9 | 11362.0 | 12064.7 | 12694.9 | 13614.3 | 13283.7 | 10645.4 |
| 57.5° | 9837.7  | 9755.9  | 9903.4  | 10761.7 | 11860.8 | 12256.0 | 13025.6 | 13579.7 | 14133.9 | 13527.9 | 10644.2 |
| 60°   | 10336.6 | 10239.8 | 10414.9 | 11492.2 | 12895.4 | 13352.8 | 14067.1 | 14177.7 | 14618.9 | 13651.2 | 10565.9 |
| 62.5° | 10753.7 | 10696.1 | 10956.4 | 12273.3 | 14051.0 | 14500.3 | 14854.0 | 14721.5 | 15027.9 | 13746.8 | 10382.7 |
| 65°   | 11194.9 | 11198.4 | 11618.9 | 13184.6 | 15279.1 | 15582.1 | 15612.0 | 15426.6 | 15370.1 | 13727.2 | 9762.9  |
| 67.5° | 11791.7 | 11847.0 | 12548.6 | 14421.9 | 16473.8 | 16707.7 | 16705.4 | 16190.4 | 15620.1 | 12948.4 | 8388.4  |
| 70°   | 12423.0 | 12553.2 | 13620.1 | 15837.9 | 17778.0 | 18015.3 | 17893.2 | 16676.6 | 14707.6 | 10470.2 | 5936.7  |
| 72.5° | 12317.1 | 12542.9 | 14215.7 | 16730.7 | 18714.6 | 18895.5 | 18101.7 | 15481.9 | 11624.6 | 6085.4  | 2527.7  |
| 75°   | 9502.5  | 9764.0  | 13034.8 | 15845.9 | 17731.9 | 17569.5 | 15553.3 | 12047.5 | 6352.7  | 1698.2  | 569.1   |
| 77.5° | 5019.7  | 5159.1  | 8610.8  | 12071.7 | 13826.3 | 13486.4 | 10956.4 | 6683.3  | 1936.7  | 420.5   | 255.8   |
| 80°   | 2629.1  | 2661.3  | 3752.4  | 6849.2  | 8533.6  | 8535.9  | 6493.2  | 2935.5  | 798.4   | 215.4   | 171.7   |
| 82.5° | 1407.9  | 1435.5  | 1982.8  | 3164.8  | 4471.3  | 4053.1  | 2486.2  | 1615.2  | 464.3   | 122.1   | 164.7   |
| 85°   | 338.7   | 344.5   | 1124.4  | 1445.9  | 1758.1  | 1255.8  | 738.5   | 1356.0  | 125.6   | 71.4    | 133.6   |
| 87.5° | 130.2   | 132.5   | 417.1   | 625.6   | 448.2   | 290.3   | 345.6   | 505.8   | 16.1    | 27.7    | 20.7    |
| 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: P323840

CATALOG NUMBER: GLEON-SA6B-740-U-SL4-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 5101.5 | 5101.5 | 5101.5 | 5101.5 | 5101.5 | 5101.5 | 5101.5 | 5101.5 | 5101.5 | 5101.5 | 5101.5 |
| 2.5°  | 5050.8 | 5020.8 | 4947.1 | 4853.8 | 4770.8 | 4710.9 | 4621.1 | 4562.3 | 4523.1 | 4522.0 | 4507.0 |
| 5°    | 4922.9 | 4861.8 | 4702.9 | 4513.9 | 4342.2 | 4187.9 | 4005.8 | 3861.8 | 3754.7 | 3737.4 | 3700.5 |
| 7.5°  | 4785.8 | 4685.6 | 4441.3 | 4146.4 | 3858.4 | 3565.7 | 3225.9 | 3015.0 | 2834.2 | 2747.7 | 2738.5 |
| 10°   | 4701.7 | 4561.1 | 4214.4 | 3788.1 | 3336.5 | 2860.7 | 2415.9 | 2108.3 | 1886.0 | 1822.6 | 1775.4 |
| 12.5° | 4684.4 | 4498.9 | 4039.2 | 3451.7 | 2806.5 | 2177.5 | 1685.5 | 1358.3 | 1180.9 | 1124.4 | 1109.5 |
| 15°   | 4701.7 | 4470.1 | 3891.8 | 3118.7 | 2269.6 | 1545.0 | 1131.4 | 941.3  | 874.4  | 858.3  | 857.2  |
| 17.5° | 4712.1 | 4435.6 | 3724.7 | 2748.9 | 1748.9 | 1103.7 | 866.4  | 811.1  | 800.7  | 799.6  | 801.9  |
| 20°   | 4710.9 | 4382.6 | 3525.4 | 2336.4 | 1300.7 | 867.5  | 783.4  | 771.9  | 769.6  | 770.8  | 769.6  |
| 22.5° | 4702.9 | 4320.4 | 3306.5 | 1911.3 | 982.7  | 775.4  | 747.7  | 740.8  | 739.6  | 739.6  | 739.6  |
| 25°   | 4717.8 | 4270.8 | 3065.7 | 1504.6 | 809.9  | 732.7  | 715.5  | 709.7  | 708.5  | 708.5  | 706.2  |
| 27.5° | 4772.0 | 4243.2 | 2801.9 | 1157.9 | 731.6  | 694.7  | 680.9  | 679.7  | 676.3  | 675.1  | 677.4  |
| 30°   | 4859.5 | 4243.2 | 2512.7 | 900.9  | 684.3  | 655.5  | 645.2  | 642.9  | 641.7  | 640.6  | 641.7  |
| 32.5° | 5013.9 | 4275.4 | 2197.0 | 748.9  | 639.4  | 611.8  | 604.9  | 608.3  | 604.9  | 604.9  | 604.9  |
| 35°   | 5292.7 | 4372.2 | 1866.4 | 653.2  | 592.2  | 569.1  | 562.2  | 566.8  | 564.5  | 564.5  | 563.4  |
| 37.5° | 5699.4 | 4551.9 | 1533.4 | 595.6  | 550.7  | 526.5  | 517.3  | 524.2  | 521.9  | 521.9  | 520.7  |
| 40°   | 6194.8 | 4813.5 | 1216.6 | 551.9  | 510.4  | 485.0  | 477.0  | 480.4  | 474.7  | 474.7  | 477.0  |
| 42.5° | 6806.6 | 5145.3 | 940.1  | 509.2  | 470.1  | 445.9  | 441.3  | 437.8  | 427.4  | 421.7  | 422.8  |
| 45°   | 7486.3 | 5490.9 | 732.7  | 467.8  | 432.0  | 412.5  | 405.5  | 396.3  | 379.0  | 367.5  | 368.7  |
| 47.5° | 8093.5 | 5757.0 | 595.6  | 427.4  | 397.5  | 382.5  | 372.1  | 354.8  | 329.5  | 315.7  | 316.8  |
| 50°   | 8412.6 | 5797.3 | 506.9  | 387.1  | 365.2  | 350.2  | 335.3  | 308.8  | 278.8  | 263.8  | 262.7  |
| 52.5° | 8494.4 | 5608.4 | 441.3  | 350.2  | 333.0  | 315.7  | 296.1  | 260.4  | 227.0  | 210.8  | 208.5  |
| 55°   | 8524.4 | 5320.4 | 382.5  | 315.7  | 298.4  | 278.8  | 253.5  | 213.1  | 182.0  | 165.9  | 164.7  |
| 57.5° | 8425.3 | 4890.6 | 336.4  | 284.6  | 263.8  | 239.6  | 208.5  | 170.5  | 140.6  | 127.9  | 127.9  |
| 60°   | 8205.2 | 4308.8 | 300.7  | 251.2  | 228.1  | 200.5  | 168.2  | 132.5  | 104.8  | 94.5   | 94.5   |
| 62.5° | 7766.3 | 3555.4 | 267.3  | 216.6  | 194.7  | 165.9  | 135.9  | 100.2  | 73.7   | 68.0   | 69.1   |
| 65°   | 6937.9 | 2697.1 | 233.9  | 185.5  | 165.9  | 137.1  | 106.0  | 71.4   | 49.5   | 49.5   | 51.8   |
| 67.5° | 5657.9 | 1873.3 | 199.3  | 157.8  | 142.9  | 111.8  | 80.6   | 49.5   | 34.6   | 39.2   | 43.8   |
| 70°   | 3745.5 | 1050.7 | 170.5  | 130.2  | 122.1  | 88.7   | 59.9   | 33.4   | 27.7   | 36.9   | 44.9   |
| 72.5° | 1413.6 | 409.0  | 142.9  | 104.8  | 106.0  | 68.0   | 42.6   | 25.3   | 25.3   | 40.3   | 53.0   |
| 75°   | 394.0  | 200.5  | 102.5  | 77.2   | 83.0   | 49.5   | 31.1   | 21.9   | 24.2   | 46.1   | 62.2   |
| 77.5° | 231.6  | 147.5  | 66.8   | 44.9   | 56.5   | 34.6   | 20.7   | 17.3   | 20.7   | 39.2   | 59.9   |
| 80°   | 186.6  | 78.3   | 39.2   | 23.0   | 31.1   | 19.6   | 13.8   | 10.4   | 5.8    | 15.0   | 31.1   |
| 82.5° | 186.6  | 47.2   | 18.4   | 16.1   | 16.1   | 10.4   | 6.9    | 4.6    | 1.2    | 0.0    | 8.1    |
| 85°   | 125.6  | 19.6   | 11.5   | 10.4   | 8.1    | 3.5    | 2.3    | 1.2    | 0.0    | 0.0    | 0.0    |
| 87.5° | 20.7   | 8.1    | 4.6    | 2.3    | 1.2    | 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-79-08: Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Report Prepared for

Cooper Lighting Solutions

MCGRAW, INVUE, LUMARK AND STREETWORKS

DATA VALID FOR LUMINAIRES UTILIZING SA LIGHT ENGINES

Report Number: SP1-2101-121-2

Luminaire Tested: IFLD-S-SA2A-740-U-T3R-HSS

Test Date: 03/05/2021

### Test Information

Test Method: LM-79-08  
 Report Number: SP1-2101-121-2  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1  
 Measurement Geometry:  $4\pi$   
 Issue Date: 03/05/2021  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: STREETWORKS  
 Catalog Number: **IFLD-S-SA2A-740-U-T3R-HSS**  
 Description: STREETWORKS INF FLOOD

SHIELD, DRIVER PROGRAMMED @ 615mA.

### Spectral Parameters

|                           |         |           |      |      |       |
|---------------------------|---------|-----------|------|------|-------|
| CCT (K):                  | 3905    | CRI (Ra): | 71.2 |      |       |
| CIE u':                   | 0.2273  | R1:       | 68.9 | R9:  | -29.7 |
| CIE v':                   | 0.5024  | R2:       | 77.0 | R10: | 46.2  |
| Duv:                      | -0.0008 | R3:       | 84.0 | R11: | 68.8  |
| CIE x:                    | 0.3841  | R4:       | 71.6 | R12: | 45.6  |
| CIE y:                    | 0.3774  | R5:       | 68.9 | R13: | 69.5  |
| CIE z:                    | 0.2385  | R6:       | 68.3 | R14: | 90.7  |
| Peak Wavelength (nm):     | 443     | R7:       | 78.7 |      |       |
| Dominant Wavelength (nm): | 579     | R8:       | 52.2 |      |       |
| Purity:                   | 28.7    |           |      |      |       |
| Rf:                       | 71.7    |           |      |      |       |
| Rg:                       | 96.9    |           |      |      |       |



### Test Conditions

Stabilization Time: 211M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 24.8/312%  
 Sphere Temperature (°C): 24.1

REPORT NUMBER: SP1-2101-121-2

| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | IN0058                | 1/31/2021        | 7/31/2021            |
| Power Meter                    | IN0071                | 12/1/2020        | 12/1/2021            |
| AC Power Source                | IN0063                | 12/1/2020        | 12/1/2021            |
| DC Power Source                | IN0208                | 12/1/2020        | 12/1/2021            |
| Sphere Thermometer             | IN0085                | 12/1/2020        | 12/1/2021            |
| Room Thermometer               | IN0046                | 12/1/2020        | 12/1/2021            |

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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 4000K 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       | 2304             | 0.0              | 490       | 19043            | 2.7              | 620       | 97577            | 25.4             | 750       | 4830             | 0.0              | 880       | 3505             | 0.0              |
| 365       | 2150             | 0.0              | 495       | 26606            | 4.8              | 625       | 90158            | 19.9             | 755       | 4664             | 0.0              | 885       | 2991             | 0.0              |
| 370       | 2146             | 0.0              | 500       | 36376            | 8.0              | 630       | 82240            | 14.9             | 760       | 4006             | 0.0              | 890       | 2327             | 0.0              |
| 375       | 2332             | 0.0              | 505       | 47714            | 13.3             | 635       | 74361            | 11.2             | 765       | 3715             | 0.0              | 895       | 2775             | 0.0              |
| 380       | 2527             | 0.0              | 510       | 58741            | 20.2             | 640       | 66994            | 8.0              | 770       | 3696             | 0.0              | 900       | 2141             | 0.0              |
| 385       | 2304             | 0.0              | 515       | 68716            | 28.5             | 645       | 60405            | 5.8              | 775       | 3117             | 0.0              | 905       | 2421             | 0.0              |
| 390       | 2064             | 0.0              | 520       | 77136            | 37.4             | 650       | 53806            | 3.9              | 780       | 3062             | 0.0              | 910       | 2200             | 0.0              |
| 395       | 1856             | 0.0              | 525       | 83567            | 44.9             | 655       | 47610            | 2.7              | 785       | 2907             | 0.0              | 915       | 2716             | 0.0              |
| 400       | 1856             | 0.0              | 530       | 89283            | 52.6             | 660       | 42018            | 1.8              | 790       | 2655             | 0.0              | 920       | 2656             | 0.0              |
| 405       | 2374             | 0.0              | 535       | 94097            | 58.4             | 665       | 36742            | 1.2              | 795       | 2467             | 0.0              | 925       | 2671             | 0.0              |
| 410       | 4084             | 0.0              | 540       | 96845            | 63.1             | 670       | 32105            | 0.7              | 800       | 2609             | 0.0              | 930       | 3292             | 0.0              |
| 415       | 8543             | 0.0              | 545       | 100829           | 67.1             | 675       | 27946            | 0.5              | 805       | 2293             | 0.0              | 935       | 3188             | 0.0              |
| 420       | 18394            | 0.1              | 550       | 105648           | 71.8             | 680       | 24146            | 0.3              | 810       | 2188             | 0.0              | 940       | 1997             | 0.0              |
| 425       | 37987            | 0.2              | 555       | 110017           | 75.1             | 685       | 21191            | 0.2              | 815       | 2386             | 0.0              | 945       | 2623             | 0.0              |
| 430       | 67605            | 0.5              | 560       | 114586           | 77.9             | 690       | 18544            | 0.1              | 820       | 2712             | 0.0              | 950       | 2969             | 0.0              |
| 435       | 102160           | 1.2              | 565       | 118987           | 79.1             | 695       | 16058            | 0.1              | 825       | 2473             | 0.0              | 955       | 2277             | 0.0              |
| 440       | 135103           | 2.1              | 570       | 122326           | 79.5             | 700       | 14133            | 0.0              | 830       | 1969             | 0.0              | 960       | 4267             | 0.0              |
| 445       | 140126           | 2.9              | 575       | 125968           | 78.4             | 705       | 12309            | 0.0              | 835       | 1917             | 0.0              | 965       | 2034             | 0.0              |
| 450       | 102339           | 2.7              | 580       | 127613           | 75.8             | 710       | 11142            | 0.0              | 840       | 2248             | 0.0              | 970       | 3586             | 0.0              |
| 455       | 58751            | 2.0              | 585       | 129466           | 71.9             | 715       | 10143            | 0.0              | 845       | 2266             | 0.0              | 975       | 2505             | 0.0              |
| 460       | 36892            | 1.5              | 590       | 128813           | 66.6             | 720       | 9072             | 0.0              | 850       | 2558             | 0.0              | 980       | 2666             | 0.0              |
| 465       | 24637            | 1.3              | 595       | 126387           | 59.9             | 725       | 8130             | 0.0              | 855       | 2767             | 0.0              | 985       | 2934             | 0.0              |
| 470       | 16738            | 1.0              | 600       | 123477           | 53.2             | 730       | 7149             | 0.0              | 860       | 2826             | 0.0              | 990       | 4120             | 0.0              |
| 475       | 13456            | 1.1              | 605       | 118718           | 46.0             | 735       | 6311             | 0.0              | 865       | 2385             | 0.0              | 995       | 3858             | 0.0              |
| 480       | 13081            | 1.2              | 610       | 112091           | 38.5             | 740       | 5711             | 0.0              | 870       | 3194             | 0.0              | 1000      | 3405             | 0.0              |
| 485       | 14734            | 1.7              | 615       | 105039           | 31.7             | 745       | 5111             | 0.0              | 875       | 3189             | 0.0              |           |                  |                  |

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### Scotopic Flux vs. Wavelength


**Scotopic Lumens: 10425.8**
**S/P: 1.47**

| $\lambda$<br>(nm) | Power<br>( $\mu\text{W/nm}$ ) | Lumens<br>( $\Phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W/nm}$ ) | Lumens<br>( $\Phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W/nm}$ ) | Lumens<br>( $\Phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W/nm}$ ) | Lumens<br>( $\Phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W/nm}$ ) | Lumens<br>( $\Phi/\text{nm}$ ) |
|-------------------|-------------------------------|--------------------------------|-------------------|-------------------------------|--------------------------------|-------------------|-------------------------------|--------------------------------|-------------------|-------------------------------|--------------------------------|-------------------|-------------------------------|--------------------------------|
| 360               | 2304                          | 0.0                            | 490               | 19043                         | 29.3                           | 620               | 97577                         | 1.2                            | 750               | 4830                          | 0.0                            | 880               | 3505                          | 0.0                            |
| 365               | 2150                          | 0.0                            | 495               | 26606                         | 43.0                           | 625               | 90158                         | 0.8                            | 755               | 4664                          | 0.0                            | 885               | 2991                          | 0.0                            |
| 370               | 2146                          | 0.0                            | 500               | 36376                         | 60.8                           | 630               | 82240                         | 0.5                            | 760               | 4006                          | 0.0                            | 890               | 2327                          | 0.0                            |
| 375               | 2332                          | 0.0                            | 505               | 47714                         | 81.1                           | 635               | 74361                         | 0.3                            | 765               | 3715                          | 0.0                            | 895               | 2775                          | 0.0                            |
| 380               | 2527                          | 0.0                            | 510               | 58741                         | 99.6                           | 640               | 66994                         | 0.2                            | 770               | 3696                          | 0.0                            | 900               | 2141                          | 0.0                            |
| 385               | 2304                          | 0.0                            | 515               | 68716                         | 113.9                          | 645               | 60405                         | 0.1                            | 775               | 3117                          | 0.0                            | 905               | 2421                          | 0.0                            |
| 390               | 2064                          | 0.0                            | 520               | 77136                         | 122.6                          | 650               | 53806                         | 0.1                            | 780               | 3062                          | 0.0                            | 910               | 2200                          | 0.0                            |
| 395               | 1856                          | 0.0                            | 525               | 83567                         | 125.0                          | 655               | 47610                         | 0.0                            | 785               | 2907                          | 0.0                            | 915               | 2716                          | 0.0                            |
| 400               | 1856                          | 0.0                            | 530               | 89283                         | 123.1                          | 660               | 42018                         | 0.0                            | 790               | 2655                          | 0.0                            | 920               | 2656                          | 0.0                            |
| 405               | 2374                          | 0.1                            | 535               | 94097                         | 117.3                          | 665               | 36742                         | 0.0                            | 795               | 2467                          | 0.0                            | 925               | 2671                          | 0.0                            |
| 410               | 4084                          | 0.2                            | 540               | 96845                         | 107.0                          | 670               | 32105                         | 0.0                            | 800               | 2609                          | 0.0                            | 930               | 3292                          | 0.0                            |
| 415               | 8543                          | 0.9                            | 545               | 100829                        | 96.7                           | 675               | 27946                         | 0.0                            | 805               | 2293                          | 0.0                            | 935               | 3188                          | 0.0                            |
| 420               | 18394                         | 3.0                            | 550               | 105648                        | 86.4                           | 680               | 24146                         | 0.0                            | 810               | 2188                          | 0.0                            | 940               | 1997                          | 0.0                            |
| 425               | 37987                         | 9.3                            | 555               | 110017                        | 75.2                           | 685               | 21191                         | 0.0                            | 815               | 2386                          | 0.0                            | 945               | 2623                          | 0.0                            |
| 430               | 67605                         | 23.0                           | 560               | 114586                        | 64.0                           | 690               | 18544                         | 0.0                            | 820               | 2712                          | 0.0                            | 950               | 2969                          | 0.0                            |
| 435               | 102160                        | 45.7                           | 565               | 118987                        | 53.4                           | 695               | 16058                         | 0.0                            | 825               | 2473                          | 0.0                            | 955               | 2277                          | 0.0                            |
| 440               | 135103                        | 75.5                           | 570               | 122326                        | 43.2                           | 700               | 14133                         | 0.0                            | 830               | 1969                          | 0.0                            | 960               | 4267                          | 0.0                            |
| 445               | 140126                        | 93.8                           | 575               | 125968                        | 34.3                           | 705               | 12309                         | 0.0                            | 835               | 1917                          | 0.0                            | 965               | 2034                          | 0.0                            |
| 450               | 102339                        | 79.3                           | 580               | 127613                        | 26.3                           | 710               | 11142                         | 0.0                            | 840               | 2248                          | 0.0                            | 970               | 3586                          | 0.0                            |
| 455               | 58751                         | 51.3                           | 585               | 129466                        | 19.8                           | 715               | 10143                         | 0.0                            | 845               | 2266                          | 0.0                            | 975               | 2505                          | 0.0                            |
| 460               | 36892                         | 35.6                           | 590               | 128813                        | 14.3                           | 720               | 9072                          | 0.0                            | 850               | 2558                          | 0.0                            | 980               | 2666                          | 0.0                            |
| 465               | 24637                         | 26.0                           | 595               | 126387                        | 10.1                           | 725               | 8130                          | 0.0                            | 855               | 2767                          | 0.0                            | 985               | 2934                          | 0.0                            |
| 470               | 16738                         | 19.3                           | 600               | 123477                        | 7.0                            | 730               | 7149                          | 0.0                            | 860               | 2826                          | 0.0                            | 990               | 4120                          | 0.0                            |
| 475               | 13456                         | 16.8                           | 605               | 118718                        | 4.7                            | 735               | 6311                          | 0.0                            | 865               | 2385                          | 0.0                            | 995               | 3858                          | 0.0                            |
| 480               | 13081                         | 17.7                           | 610               | 112091                        | 3.0                            | 740               | 5711                          | 0.0                            | 870               | 3194                          | 0.0                            | 1000              | 3405                          | 0.0                            |
| 485               | 14734                         | 21.4                           | 615               | 105039                        | 1.9                            | 745               | 5111                          | 0.0                            | 875               | 3189                          | 0.0                            |                   |                               |                                |

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### Melanopic Flux vs. Wavelength



**Melanopic Lumens: 3927.2**      **M/P: 0.55**

| 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       | 2304             | 0.0              | 490       | 19043            | 15.8             | 620       | 97577            | 0.1              | 750       | 4830             | 0.0              | 880       | 3505             | 0.0              |
| 365       | 2150             | 0.0              | 495       | 26606            | 22.0             | 625       | 90158            | 0.0              | 755       | 4664             | 0.0              | 885       | 2991             | 0.0              |
| 370       | 2146             | 0.0              | 500       | 36376            | 29.2             | 630       | 82240            | 0.0              | 760       | 4006             | 0.0              | 890       | 2327             | 0.0              |
| 375       | 2332             | 0.0              | 505       | 47714            | 36.6             | 635       | 74361            | 0.0              | 765       | 3715             | 0.0              | 895       | 2775             | 0.0              |
| 380       | 2527             | 0.0              | 510       | 58741            | 42.2             | 640       | 66994            | 0.0              | 770       | 3696             | 0.0              | 900       | 2141             | 0.0              |
| 385       | 2304             | 0.0              | 515       | 68716            | 44.9             | 645       | 60405            | 0.0              | 775       | 3117             | 0.0              | 905       | 2421             | 0.0              |
| 390       | 2064             | 0.0              | 520       | 77136            | 44.9             | 650       | 53806            | 0.0              | 780       | 3062             | 0.0              | 910       | 2200             | 0.0              |
| 395       | 1856             | 0.0              | 525       | 83567            | 42.4             | 655       | 47610            | 0.0              | 785       | 2907             | 0.0              | 915       | 2716             | 0.0              |
| 400       | 1856             | 0.0              | 530       | 89283            | 38.6             | 660       | 42018            | 0.0              | 790       | 2655             | 0.0              | 920       | 2656             | 0.0              |
| 405       | 2374             | 0.0              | 535       | 94097            | 33.9             | 665       | 36742            | 0.0              | 795       | 2467             | 0.0              | 925       | 2671             | 0.0              |
| 410       | 4084             | 0.2              | 540       | 96845            | 28.3             | 670       | 32105            | 0.0              | 800       | 2609             | 0.0              | 930       | 3292             | 0.0              |
| 415       | 8543             | 0.6              | 545       | 100829           | 23.4             | 675       | 27946            | 0.0              | 805       | 2293             | 0.0              | 935       | 3188             | 0.0              |
| 420       | 18394            | 2.1              | 550       | 105648           | 19.0             | 680       | 24146            | 0.0              | 810       | 2188             | 0.0              | 940       | 1997             | 0.0              |
| 425       | 37987            | 5.9              | 555       | 110017           | 14.8             | 685       | 21191            | 0.0              | 815       | 2386             | 0.0              | 945       | 2623             | 0.0              |
| 430       | 67605            | 14.3             | 560       | 114586           | 11.3             | 690       | 18544            | 0.0              | 820       | 2712             | 0.0              | 950       | 2969             | 0.0              |
| 435       | 102160           | 27.3             | 565       | 118987           | 8.4              | 695       | 16058            | 0.0              | 825       | 2473             | 0.0              | 955       | 2277             | 0.0              |
| 440       | 135103           | 45.1             | 570       | 122326           | 6.0              | 700       | 14133            | 0.0              | 830       | 1969             | 0.0              | 960       | 4267             | 0.0              |
| 445       | 140126           | 55.3             | 575       | 125968           | 4.2              | 705       | 12309            | 0.0              | 835       | 1917             | 0.0              | 965       | 2034             | 0.0              |
| 450       | 102339           | 47.2             | 580       | 127613           | 2.9              | 710       | 11142            | 0.0              | 840       | 2248             | 0.0              | 970       | 3586             | 0.0              |
| 455       | 58751            | 30.8             | 585       | 129466           | 1.9              | 715       | 10143            | 0.0              | 845       | 2266             | 0.0              | 975       | 2505             | 0.0              |
| 460       | 36892            | 21.7             | 590       | 128813           | 1.3              | 720       | 9072             | 0.0              | 850       | 2558             | 0.0              | 980       | 2666             | 0.0              |
| 465       | 24637            | 16.1             | 595       | 126387           | 0.8              | 725       | 8130             | 0.0              | 855       | 2767             | 0.0              | 985       | 2934             | 0.0              |
| 470       | 16738            | 12.0             | 600       | 123477           | 0.5              | 730       | 7149             | 0.0              | 860       | 2826             | 0.0              | 990       | 4120             | 0.0              |
| 475       | 13456            | 10.3             | 605       | 118718           | 0.3              | 735       | 6311             | 0.0              | 865       | 2385             | 0.0              | 995       | 3858             | 0.0              |
| 480       | 13081            | 10.5             | 610       | 112091           | 0.2              | 740       | 5711             | 0.0              | 870       | 3194             | 0.0              | 1000      | 3405             | 0.0              |
| 485       | 14734            | 12.1             | 615       | 105039           | 0.1              | 745       | 5111             | 0.0              | 875       | 3189             | 0.0              |           |                  |                  |

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TM-30-18

### Summary

$R_f = 71.7$   
 $R_g = 96.9$   
 CIE  $R_a = 71.2$   
 $R_g = -29.7$



### Color Vector Graphics



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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 55 | CES51 = 86 | CES76 = 45 |
| CES02 = 61 | CES27 = 80 | CES52 = 87 | CES77 = 68 |
| CES03 = 30 | CES28 = 79 | CES53 = 74 | CES78 = 49 |
| CES04 = 70 | CES29 = 51 | CES54 = 81 | CES79 = 77 |
| CES05 = 47 | CES30 = 60 | CES55 = 80 | CES80 = 75 |
| CES06 = 50 | CES31 = 56 | CES56 = 69 | CES81 = 75 |
| CES07 = 40 | CES32 = 52 | CES57 = 67 | CES82 = 90 |
| CES08 = 39 | CES33 = 62 | CES58 = 69 | CES83 = 85 |
| CES09 = 29 | CES34 = 65 | CES59 = 86 | CES84 = 87 |
| CES10 = 74 | CES35 = 81 | CES60 = 91 | CES85 = 83 |
| CES11 = 57 | CES36 = 92 | CES61 = 85 | CES86 = 72 |
| CES12 = 63 | CES37 = 74 | CES62 = 81 | CES87 = 77 |
| CES13 = 42 | CES38 = 69 | CES63 = 72 | CES88 = 77 |
| CES14 = 74 | CES39 = 92 | CES64 = 69 | CES89 = 72 |
| CES15 = 71 | CES40 = 86 | CES65 = 64 | CES90 = 75 |
| CES16 = 46 | CES41 = 84 | CES66 = 63 | CES91 = 91 |
| CES17 = 49 | CES42 = 75 | CES67 = 60 | CES92 = 66 |
| CES18 = 56 | CES43 = 70 | CES68 = 67 | CES93 = 80 |
| CES19 = 72 | CES44 = 98 | CES69 = 77 | CES94 = 56 |
| CES20 = 65 | CES45 = 80 | CES70 = 57 | CES95 = 72 |
| CES21 = 86 | CES46 = 77 | CES71 = 53 | CES96 = 78 |
| CES22 = 78 | CES47 = 74 | CES72 = 84 | CES97 = 83 |
| CES23 = 92 | CES48 = 66 | CES73 = 47 | CES98 = 73 |
| CES24 = 91 | CES49 = 76 | CES74 = 96 | CES99 = 63 |
| CES25 = 72 | CES50 = 85 | CES75 = 52 |            |



**Color Rendition by Hue-Angle Bin**


**Measure Comparisons**



(END OF REPORT)