

Signify Classified - Internal  
Cooper Lighting Solutions Photometric Lab  
1121 Highway 74 South  
Peachtree City, GA 30269



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: P323543

Luminaire Tested: **GLEON-SA9D-740-U-SL3-HSS**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P323543  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-23)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA9D-740-U-SL3-HSS  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(9) 70 CRI, 4000K, 1200mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE III  
SPILL LIGHT ELIMINATOR OPTICS WITH HOUSE SIDE SHIELD  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 59261 lumens  
Efficiency: N/A  
Efficacy: 103.1 lumens/watt  
Luminous Opening: Rectangular (W 2.5' x L: 1' x H: 0')  
IES Classification: Type III - Medium  
BUG Rating: B3 - U0 - G5

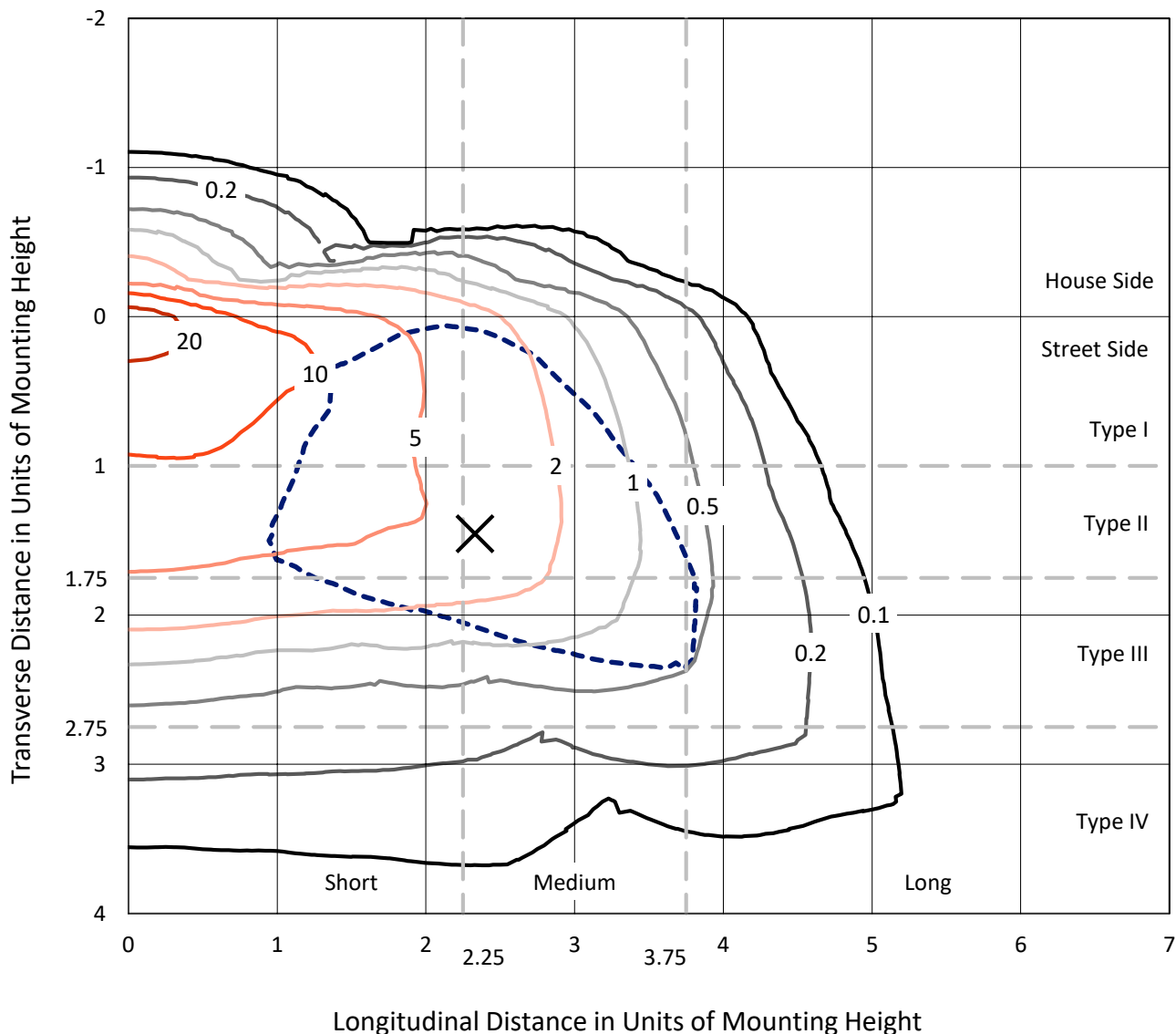
Input Watts (W): 575  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



REPORT NUMBER: P323543  
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### Iso-Footcandle Lines of Horizontal Illumination

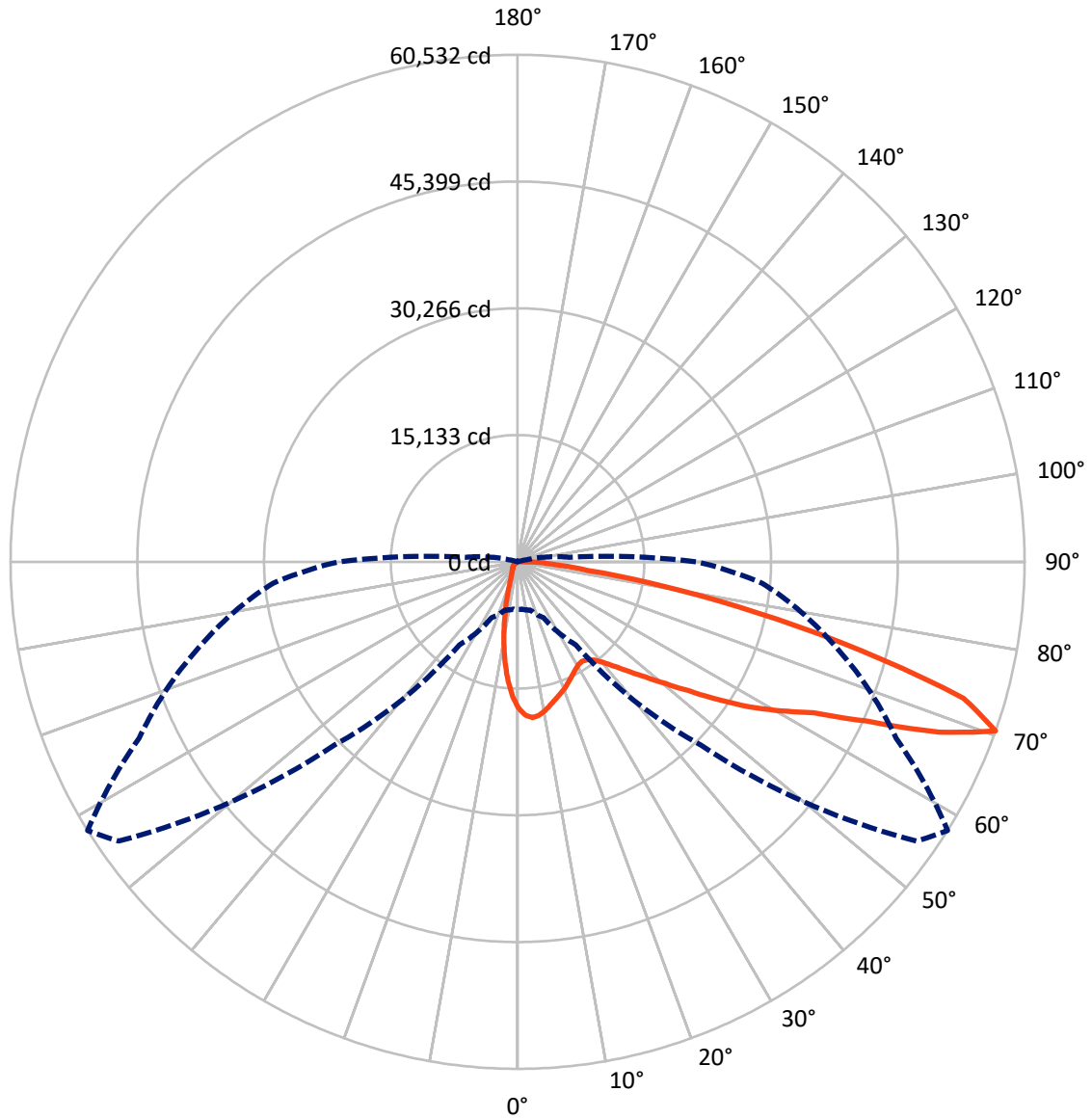
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 28.4 fc  
 Type III - Medium - N/A

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### Luminous Intensity Polar Plot



— Vertical Plane Through 58-Deg Lateral      - - - Horizontal Cone Through 70-Deg Vertical

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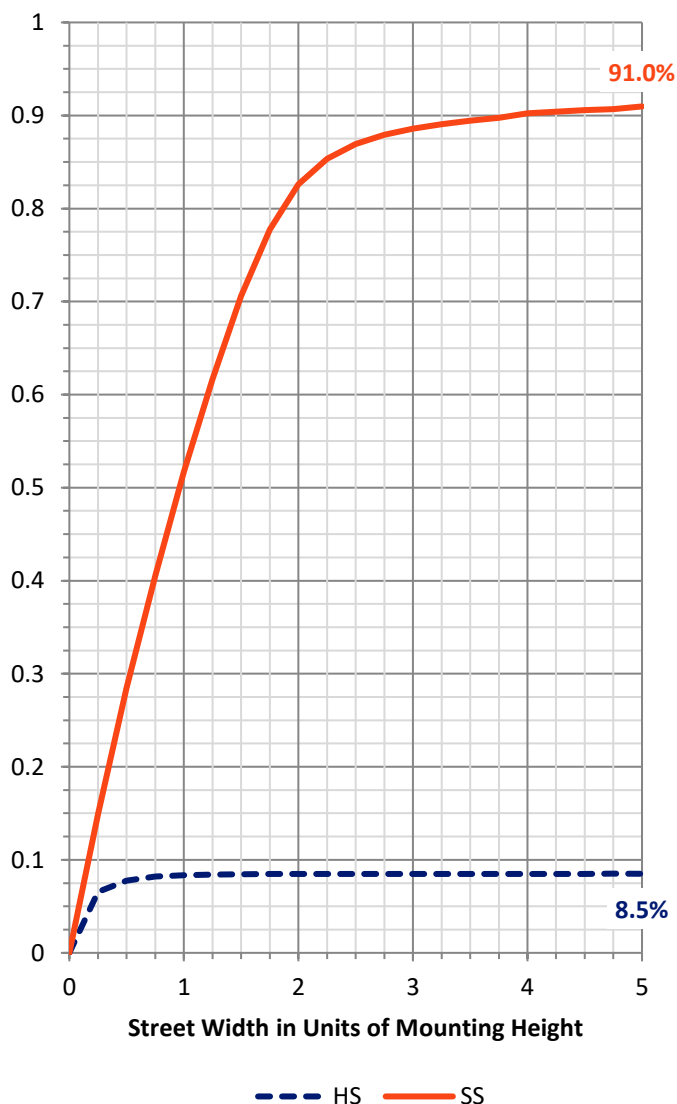
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 5071.4   | 0.0    | 5071.4  |
|                    | % Fixture | 8.6      | 0.0    | 8.6     |
| <b>Street Side</b> | Lumens    | 54189.6  | 0.0    | 54189.6 |
|                    | % Fixture | 91.4     | 0.0    | 91.4    |
| <b>Total</b>       | Lumens    | 59261.0  | 0.0    | 59261.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 1431.5  | 2.4       |
| 10°-20°   | 3004.4  | 5.1       |
| 20°-30°   | 3949.7  | 6.7       |
| 30°-40°   | 5231.0  | 8.8       |
| 40°-50°   | 7818.7  | 13.2      |
| 50°-60°   | 12525.2 | 21.1      |
| 60°-70°   | 15787.9 | 26.6      |
| 70°-80°   | 8515.9  | 14.4      |
| 80°-90°   | 996.8   | 1.7       |
| 90°-100°  | 0.0     | 0.0       |
| 100°-110° | 0.0     | 0.0       |
| 110°-120° | 0.0     | 0.0       |
| 120°-130° | 0.0     | 0.0       |
| 130°-140° | 0.0     | 0.0       |
| 140°-150° | 0.0     | 0.0       |
| 150°-160° | 0.0     | 0.0       |
| 160°-170° | 0.0     | 0.0       |
| 170°-180° | 0.0     | 0.0       |
| 0°-90°    | 59261.0 | 100.0     |
| 0°-180°   | 59261.0 | 100.0     |

**Coefficient of Utilization**

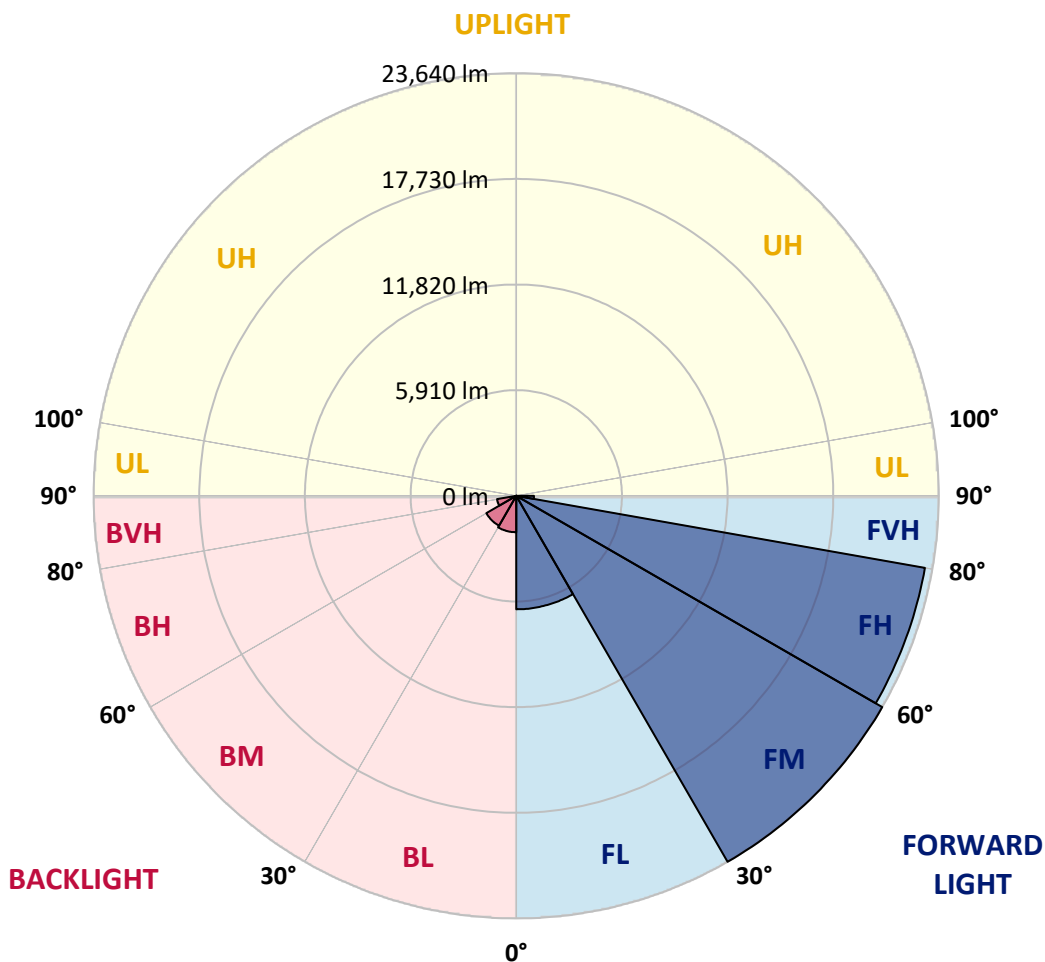


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**LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:**

| Zone           | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |         |
|----------------|---------|-----------|-------------------------|------|---------|
|                |         |           | B                       | U    | G       |
| FL (0°-30°)    | 6348.1  | 10.7      |                         |      |         |
| FM (30°-60°)   | 23640.1 | 39.9      |                         |      |         |
| FH (60°-80°)   | 23213.2 | 39.2      |                         |      | G5      |
| FVH (80°-90°)  | 988.2   | 1.7       |                         |      | G5      |
| BL (0°-30°)    | 2037.5  | 3.4       | B3/2500                 |      |         |
| BM (30°-60°)   | 1934.7  | 3.3       | B2/2500                 |      |         |
| BH (60°-80°)   | 1090.6  | 1.8       | B3/2500                 |      | G3/2500 |
| BVH (80°-90°)  | 8.6     | 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





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 45°     | 55°     | 58°     | 65°     | 75°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 17505.4 | 17505.4 | 17505.4 | 17505.4 | 17505.4 | 17505.4 | 17505.4 | 17505.4 | 17505.4 | 17505.4 | 17505.4 |
| 2.5°  | 18956.8 | 18910.0 | 18892.7 | 18863.2 | 18749.8 | 18638.9 | 18419.6 | 18358.0 | 18220.0 | 17892.3 | 17544.8 |
| 5°    | 18971.6 | 18969.1 | 19020.9 | 19008.6 | 18969.1 | 18917.4 | 18759.7 | 18678.4 | 18444.3 | 17976.1 | 17340.3 |
| 7.5°  | 18057.4 | 18104.2 | 18220.0 | 18313.7 | 18422.1 | 18562.5 | 18582.3 | 18503.4 | 18311.2 | 17806.0 | 16963.3 |
| 10°   | 16830.2 | 16904.2 | 17066.8 | 17251.6 | 17535.0 | 17815.9 | 18067.2 | 18057.4 | 17990.9 | 17493.1 | 16509.9 |
| 12.5° | 15600.6 | 15686.9 | 15874.1 | 16147.7 | 16549.3 | 17007.7 | 17456.1 | 17517.7 | 17628.6 | 17212.2 | 16091.0 |
| 15°   | 14523.8 | 14597.7 | 14782.5 | 15117.6 | 15615.4 | 16231.4 | 16889.4 | 17002.7 | 17288.6 | 16992.9 | 15741.1 |
| 17.5° | 13609.6 | 13656.4 | 13791.9 | 14164.0 | 14740.6 | 15487.3 | 16342.3 | 16564.1 | 16990.4 | 16820.4 | 15438.0 |
| 20°   | 12971.4 | 12978.8 | 13067.5 | 13328.7 | 13905.3 | 14740.6 | 15775.6 | 16093.5 | 16675.0 | 16672.5 | 15125.0 |
| 22.5° | 12655.9 | 12631.3 | 12648.6 | 12798.9 | 13222.7 | 14028.5 | 15208.8 | 15585.8 | 16391.6 | 16546.9 | 14807.2 |
| 25°   | 12596.8 | 12577.1 | 12527.8 | 12547.5 | 12803.8 | 13405.1 | 14637.1 | 15073.3 | 16142.7 | 16470.5 | 14531.2 |
| 27.5° | 12781.6 | 12801.3 | 12717.5 | 12628.8 | 12648.6 | 13000.9 | 14129.5 | 14634.7 | 15940.7 | 16470.5 | 14336.5 |
| 30°   | 13153.7 | 13163.6 | 13102.0 | 12986.1 | 12830.9 | 12887.6 | 13777.1 | 14282.3 | 15839.6 | 16583.8 | 14213.3 |
| 32.5° | 13565.2 | 13619.4 | 13612.0 | 13518.4 | 13296.6 | 13067.5 | 13693.4 | 14154.2 | 15832.3 | 16835.2 | 14201.0 |
| 35°   | 14075.3 | 14136.9 | 14240.4 | 14220.7 | 13989.1 | 13612.0 | 13979.2 | 14341.4 | 15977.6 | 17249.1 | 14334.0 |
| 37.5° | 14617.4 | 14711.1 | 14932.8 | 15038.8 | 14888.5 | 14462.2 | 14619.9 | 14878.6 | 16367.0 | 17919.4 | 14671.6 |
| 40°   | 15142.3 | 15248.2 | 15652.4 | 16068.8 | 15955.5 | 15516.8 | 15590.8 | 15797.8 | 17059.4 | 18882.9 | 15312.3 |
| 42.5° | 15657.3 | 15815.0 | 16408.9 | 17093.9 | 17229.4 | 16879.5 | 16918.9 | 17084.0 | 18087.0 | 20208.6 | 16359.6 |
| 45°   | 16273.3 | 16450.8 | 17330.5 | 18175.7 | 18537.9 | 18385.1 | 18552.7 | 18661.1 | 19429.9 | 21960.6 | 17771.5 |
| 47.5° | 17177.7 | 17382.2 | 18461.5 | 19425.0 | 20060.8 | 20159.3 | 20496.9 | 20568.4 | 21127.7 | 24001.0 | 19612.3 |
| 50°   | 18942.0 | 18998.7 | 19974.5 | 20849.3 | 21766.0 | 22357.4 | 22741.8 | 22796.0 | 23182.9 | 26231.0 | 21911.3 |
| 52.5° | 21162.2 | 21199.2 | 21751.2 | 22337.6 | 23380.0 | 24587.4 | 25486.8 | 25563.2 | 25644.6 | 28404.4 | 24180.8 |
| 55°   | 23367.7 | 23362.7 | 23727.4 | 24072.4 | 25265.1 | 27019.6 | 28971.2 | 29018.0 | 28434.0 | 30466.9 | 25915.6 |
| 57.5° | 24745.1 | 24878.2 | 25432.6 | 25876.2 | 27542.0 | 29791.7 | 32499.9 | 32672.3 | 31363.9 | 31994.7 | 27630.7 |
| 60°   | 24306.5 | 24370.6 | 25600.2 | 27241.3 | 30378.2 | 33731.9 | 36070.4 | 36114.8 | 33566.8 | 33520.0 | 29799.1 |
| 62.5° | 20708.8 | 20743.3 | 22675.2 | 26058.5 | 31814.8 | 38842.6 | 40377.8 | 39655.8 | 36100.0 | 35636.7 | 32393.9 |
| 65°   | 14193.6 | 14417.8 | 16031.8 | 20213.5 | 29175.7 | 42048.5 | 47045.8 | 45850.7 | 39961.3 | 38687.4 | 34739.8 |
| 67.5° | 8358.4  | 8311.6  | 9110.0  | 12190.2 | 21428.4 | 39919.5 | 55480.6 | 54292.9 | 45227.3 | 40730.2 | 34052.3 |
| 70°   | 5709.5  | 5677.4  | 5983.0  | 7380.2  | 12096.6 | 30967.1 | 58134.6 | 60532.2 | 49877.1 | 39355.2 | 29306.3 |
| 72.5° | 4075.7  | 4093.0  | 4543.9  | 5734.1  | 7594.6  | 18042.6 | 49993.0 | 55667.9 | 48420.8 | 34308.6 | 22276.0 |
| 75°   | 2767.3  | 2814.1  | 3459.7  | 4704.1  | 6658.2  | 9179.0  | 35476.6 | 42317.1 | 39429.1 | 24934.9 | 12803.8 |
| 77.5° | 1488.4  | 1540.1  | 2301.5  | 3789.9  | 6020.0  | 6377.3  | 22820.6 | 29124.0 | 24767.3 | 11209.5 | 3711.0  |
| 80°   | 621.0   | 650.5   | 1076.8  | 2754.9  | 5201.8  | 5601.0  | 13427.2 | 17660.7 | 10554.0 | 2210.4  | 828.0   |
| 82.5° | 268.6   | 283.4   | 448.5   | 1643.6  | 3888.5  | 4728.7  | 7109.1  | 8496.4  | 3198.5  | 485.4   | 416.4   |
| 85°   | 51.7    | 54.2    | 184.8   | 869.8   | 2481.4  | 2668.7  | 4608.0  | 4516.8  | 1436.6  | 209.5   | 303.1   |
| 87.5° | 0.0     | 0.0     | 44.4    | 273.5   | 729.4   | 1453.9  | 2811.6  | 2777.1  | 487.9   | 101.0   | 113.4   |
| 90°   | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |



REPORT NUMBER: P323543

CATALOG NUMBER: GLEON-SA9D-740-U-SL3-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°     | 95°     | 105°    | 115°    | 125°    | 135°    | 145°    | 155°    | 165°    | 175°    | 180°    |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 17505.4 | 17505.4 | 17505.4 | 17505.4 | 17505.4 | 17505.4 | 17505.4 | 17505.4 | 17505.4 | 17505.4 | 17505.4 |
| 2.5°  | 17367.4 | 17197.4 | 16840.1 | 16399.0 | 16061.4 | 15689.3 | 15393.6 | 15019.1 | 14856.4 | 14863.8 | 14775.1 |
| 5°    | 16978.1 | 16628.2 | 15837.2 | 14839.2 | 14070.4 | 13276.9 | 12594.3 | 11914.2 | 11512.6 | 11382.0 | 11258.8 |
| 7.5°  | 16421.2 | 15866.8 | 14605.1 | 13067.5 | 11766.4 | 10494.9 | 9388.5  | 8415.1  | 7799.1  | 7498.5  | 7387.6  |
| 10°   | 15792.8 | 15014.1 | 13188.2 | 11162.7 | 9304.7  | 7584.7  | 6150.6  | 4903.7  | 4405.9  | 4068.3  | 3982.1  |
| 12.5° | 15240.9 | 14186.2 | 11803.3 | 9208.6  | 7003.2  | 4928.3  | 3560.7  | 2784.5  | 2446.9  | 2313.8  | 2291.7  |
| 15°   | 14720.9 | 13412.4 | 10470.2 | 7439.3  | 4849.5  | 3033.4  | 2264.6  | 2000.9  | 1922.0  | 1899.9  | 1899.9  |
| 17.5° | 14230.5 | 12675.7 | 9166.7  | 5697.1  | 3208.3  | 2126.6  | 1875.2  | 1816.1  | 1791.4  | 1789.0  | 1791.4  |
| 20°   | 13718.0 | 11938.9 | 7885.3  | 4174.3  | 2239.9  | 1801.3  | 1732.3  | 1700.3  | 1692.9  | 1692.9  | 1692.9  |
| 22.5° | 13227.6 | 11202.1 | 6638.5  | 2981.6  | 1796.4  | 1643.6  | 1609.1  | 1586.9  | 1579.5  | 1577.1  | 1572.1  |
| 25°   | 12757.0 | 10502.3 | 5421.2  | 2106.9  | 1577.1  | 1505.6  | 1476.0  | 1446.5  | 1424.3  | 1412.0  | 1404.6  |
| 27.5° | 12370.1 | 9878.8  | 4287.6  | 1690.4  | 1424.3  | 1362.7  | 1325.7  | 1281.4  | 1227.2  | 1202.5  | 1192.7  |
| 30°   | 12062.1 | 9309.6  | 3304.4  | 1426.8  | 1281.4  | 1219.8  | 1163.1  | 1086.7  | 1007.8  | 966.0   | 963.5   |
| 32.5° | 11820.6 | 8750.2  | 2508.5  | 1261.7  | 1153.2  | 1076.8  | 995.5   | 899.4   | 808.2   | 761.4   | 759.0   |
| 35°   | 11702.3 | 8257.4  | 1917.1  | 1140.9  | 1039.9  | 943.8   | 842.7   | 736.8   | 648.1   | 603.7   | 598.8   |
| 37.5° | 11781.2 | 7841.0  | 1495.7  | 1039.9  | 943.8   | 832.9   | 714.6   | 603.7   | 524.9   | 485.4   | 483.0   |
| 40°   | 12069.5 | 7574.8  | 1214.8  | 953.6   | 862.5   | 726.9   | 598.8   | 495.3   | 428.8   | 396.7   | 394.3   |
| 42.5° | 12683.1 | 7476.3  | 1037.4  | 882.2   | 783.6   | 628.4   | 497.8   | 409.1   | 347.4   | 325.3   | 320.3   |
| 45°   | 13708.1 | 7621.7  | 916.7   | 813.2   | 702.3   | 534.7   | 411.5   | 335.1   | 280.9   | 263.7   | 261.2   |
| 47.5° | 15073.3 | 8003.6  | 830.4   | 746.6   | 628.4   | 450.9   | 342.5   | 271.1   | 229.2   | 211.9   | 209.5   |
| 50°   | 16832.7 | 8609.8  | 759.0   | 680.1   | 559.4   | 381.9   | 283.4   | 214.4   | 177.4   | 165.1   | 165.1   |
| 52.5° | 18747.4 | 9331.8  | 694.9   | 618.5   | 490.4   | 317.9   | 229.2   | 165.1   | 140.5   | 125.7   | 125.7   |
| 55°   | 20329.4 | 9962.6  | 625.9   | 571.7   | 406.6   | 263.7   | 175.0   | 125.7   | 103.5   | 96.1    | 96.1    |
| 57.5° | 21908.9 | 10635.3 | 547.0   | 490.4   | 325.3   | 214.4   | 133.1   | 93.6    | 76.4    | 71.5    | 71.5    |
| 60°   | 23956.6 | 11458.4 | 470.7   | 399.2   | 256.3   | 162.6   | 98.6    | 66.5    | 56.7    | 54.2    | 54.2    |
| 62.5° | 26208.8 | 11941.3 | 401.7   | 320.3   | 199.6   | 120.7   | 71.5    | 44.4    | 41.9    | 41.9    | 39.4    |
| 65°   | 27586.3 | 11258.8 | 337.6   | 256.3   | 155.2   | 91.2    | 46.8    | 32.0    | 37.0    | 34.5    | 29.6    |
| 67.5° | 25829.4 | 8814.3  | 276.0   | 199.6   | 120.7   | 69.0    | 29.6    | 22.2    | 39.4    | 32.0    | 24.6    |
| 70°   | 21386.5 | 6170.3  | 214.4   | 140.5   | 96.1    | 59.1    | 19.7    | 14.8    | 41.9    | 32.0    | 19.7    |
| 72.5° | 16004.7 | 4129.9  | 170.0   | 93.6    | 71.5    | 51.7    | 17.2    | 7.4     | 37.0    | 27.1    | 17.2    |
| 75°   | 8745.3  | 1663.3  | 135.5   | 59.1    | 44.4    | 37.0    | 12.3    | 4.9     | 24.6    | 19.7    | 12.3    |
| 77.5° | 2301.5  | 438.6   | 98.6    | 39.4    | 24.6    | 14.8    | 7.4     | 2.5     | 12.3    | 9.9     | 4.9     |
| 80°   | 586.5   | 170.0   | 64.1    | 27.1    | 17.2    | 7.4     | 0.0     | 0.0     | 2.5     | 0.0     | 0.0     |
| 82.5° | 312.9   | 71.5    | 39.4    | 19.7    | 9.9     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| 85°   | 236.6   | 46.8    | 22.2    | 12.3    | 2.5     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| 87.5° | 91.2    | 14.8    | 7.4     | 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-79-08: 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: 4π  
 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 | R9:  | -29.7 |
| CIE u':                   | 0.2273  | R1:       | 68.9 | R10: | 46.2  |
| CIE v':                   | 0.5024  | R2:       | 77.0 | R11: | 68.8  |
| Duv:                      | -0.0008 | R3:       | 84.0 | R12: | 45.6  |
| CIE x:                    | 0.3841  | R4:       | 71.6 | R13: | 69.5  |
| CIE y:                    | 0.3774  | R5:       | 68.9 | R14: | 90.7  |
| CIE z:                    | 0.2385  | R6:       | 68.3 |      |       |
| 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 (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (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**

| λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/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**

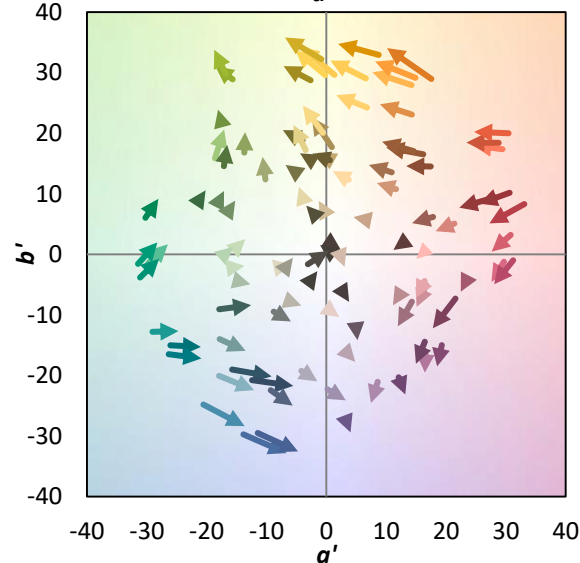
| λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) |
|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|
| 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           |        |               |               |

**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 ( $R_{f,i}$ )**

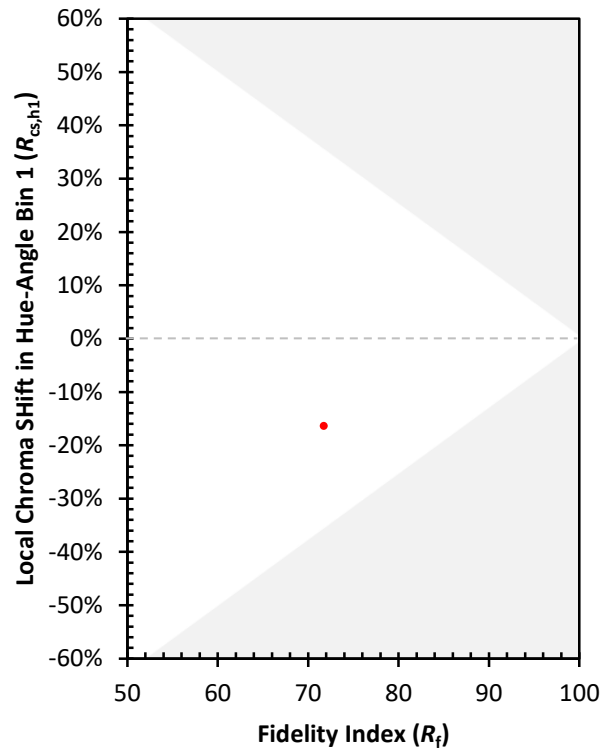
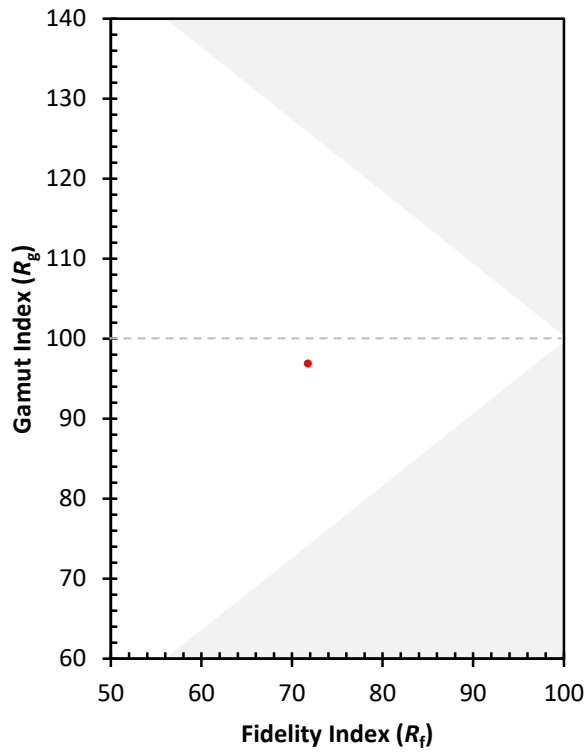
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 55 | CES51 = 86 | CES76 = 45 |
| CES02 = 61 | CES27 = 80 | CES52 = 87 | CES77 = 68 |
| CES03 = 30 | CES28 = 79 | CES53 = 74 | CES78 = 49 |
| CES04 = 70 | CES29 = 51 | CES54 = 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)