

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: P319691

Luminaire Tested: **GLEON-SA7C-740-U-SL3**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P319691  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-22)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA7C-740-U-SL3  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(7) 70 CRI, 4000K, 1050mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE III  
SPILL LIGHT ELIMINATOR OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 50033 lumens  
Efficiency: N/A  
Efficacy: 128.0 lumens/watt  
Luminous Opening: Rectangular (W 2' x L: 1' x H: 0')  
IES Classification: Type III - Medium  
BUG Rating: B3 - U0 - G5

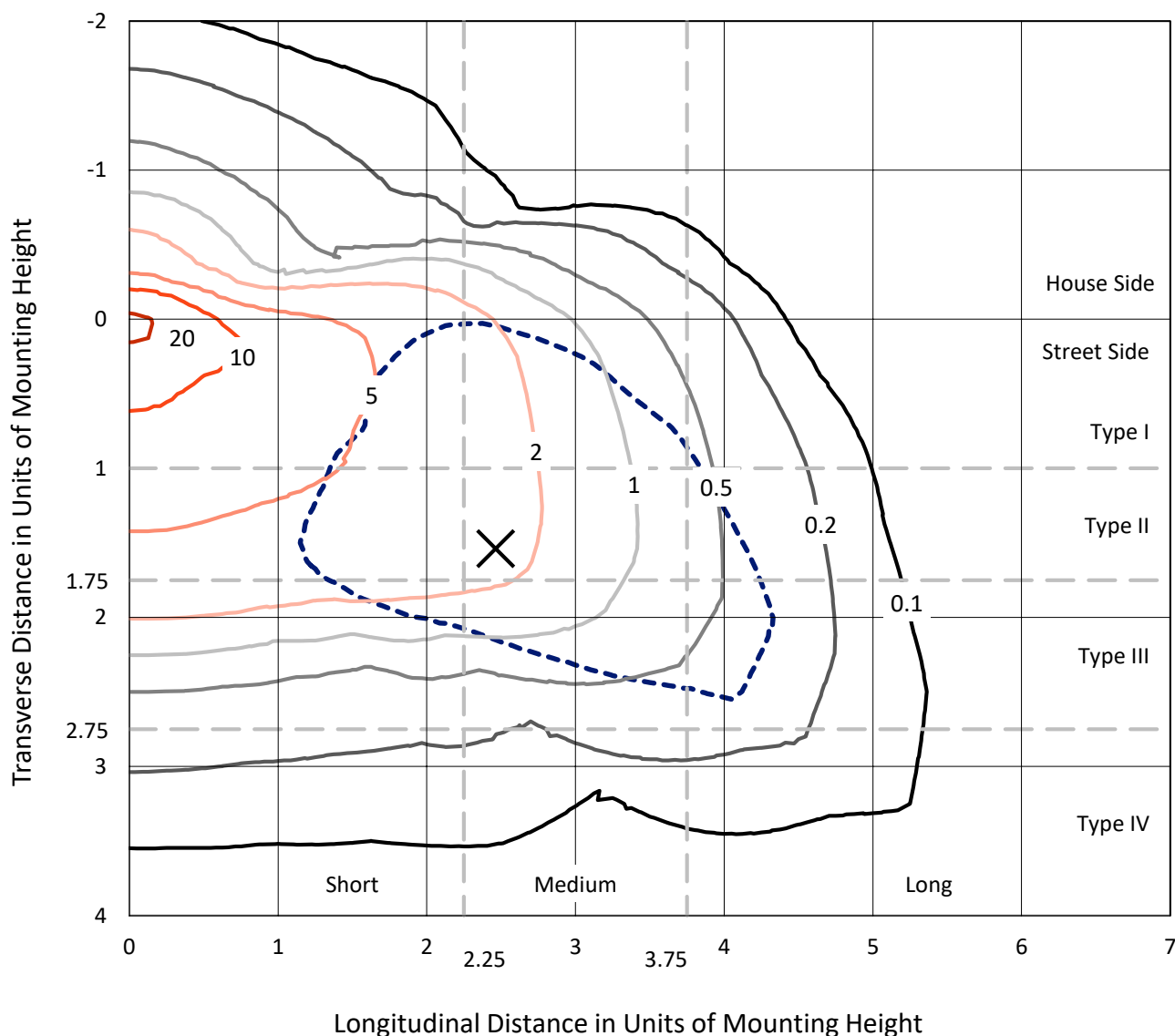
Input Watts (W): 391  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



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## Iso-Footcandle Lines of Horizontal Illumination

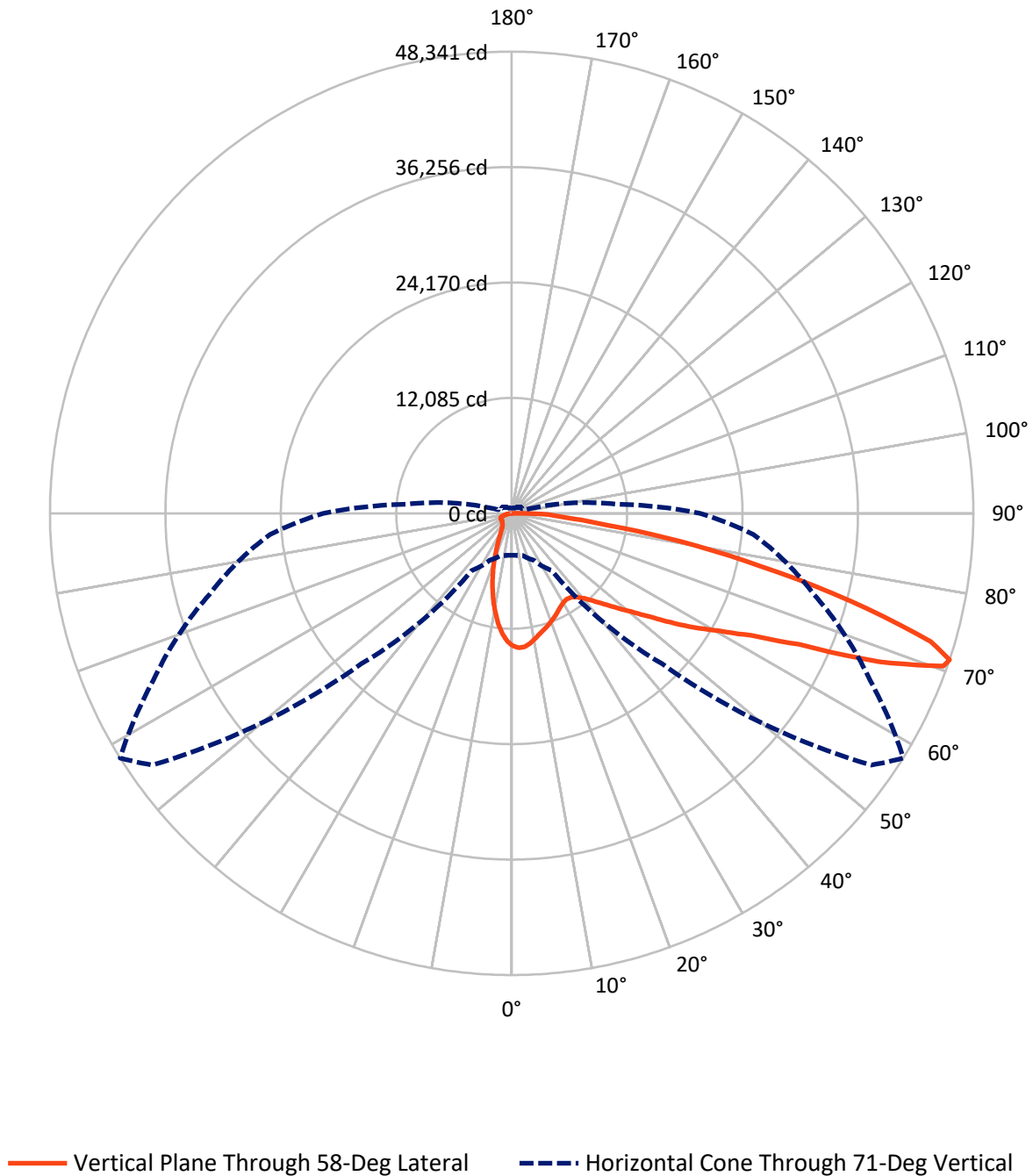
× Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 22.2 fc  
 Type III - Medium - N/A

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## Luminous Intensity Polar Plot



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**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 7480.3   | 0.0    | 7480.3  |
|                    | % Fixture | 15.0     | 0.0    | 15.0    |
| <b>Street Side</b> | Lumens    | 42552.7  | 0.0    | 42552.7 |
|                    | % Fixture | 85.0     | 0.0    | 85.0    |
| <b>Total</b>       | Lumens    | 50033.0  | 0.0    | 50033.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 1195.9  | 2.4       |
| 10°-20°   | 2659.3  | 5.3       |
| 20°-30°   | 3379.7  | 6.8       |
| 30°-40°   | 4305.0  | 8.6       |
| 40°-50°   | 6104.7  | 12.2      |
| 50°-60°   | 9447.3  | 18.9      |
| 60°-70°   | 12861.2 | 25.7      |
| 70°-80°   | 8579.9  | 17.1      |
| 80°-90°   | 1500.1  | 3.0       |
| 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°    | 50033.0 | 100.0     |
| 0°-180°   | 50033.0 | 100.0     |

**Coefficient of Utilization**



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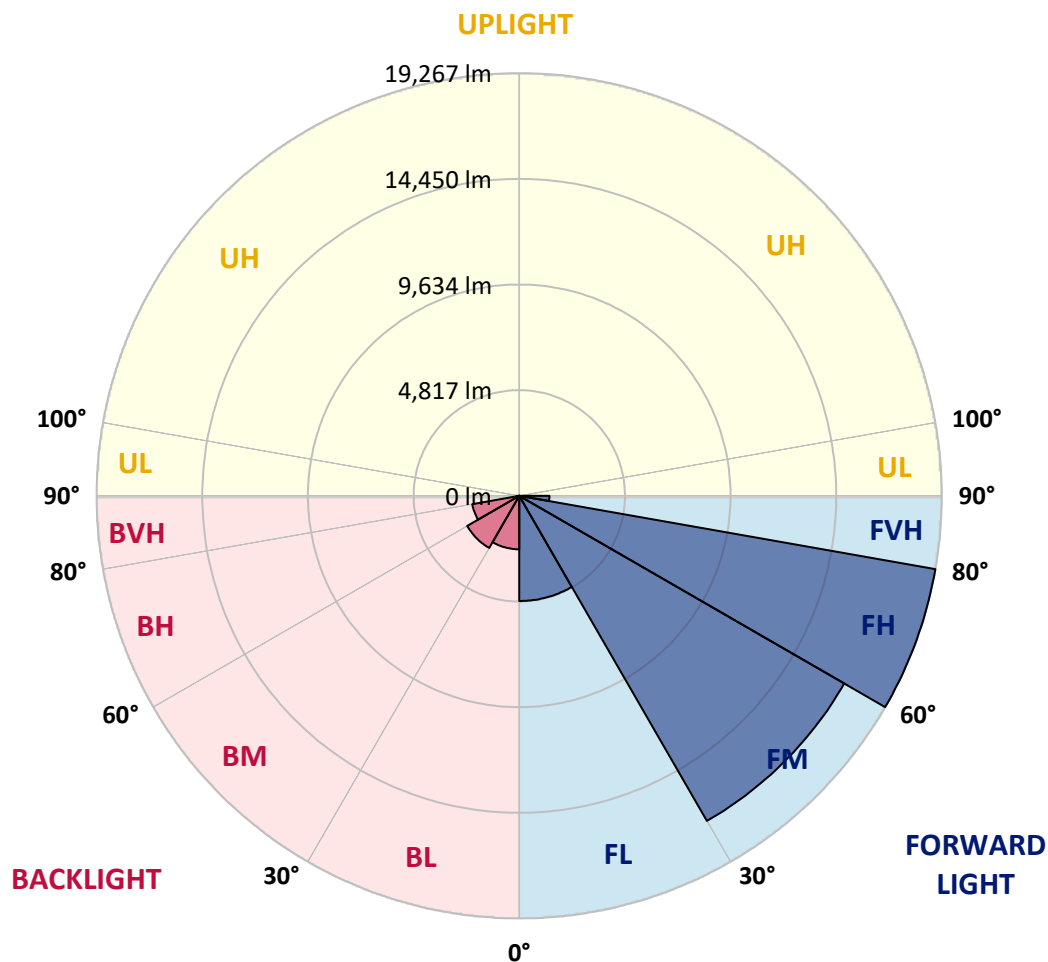
CATALOG NUMBER: GLEON-SA7C-740-U-SL3

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

| Zone |             | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|---------|-----------|-------------------------|------|---------|
|      |             |         |           | B                       | U    | G       |
| FL   | (0°-30°)    | 4796.5  | 9.6       |                         |      |         |
| FM   | (30°-60°)   | 17113.7 | 34.2      |                         |      |         |
| FH   | (60°-80°)   | 19267.1 | 38.5      |                         |      | G5      |
| FVH  | (80°-90°)   | 1375.4  | 2.7       |                         |      | G5      |
| BL   | (0°-30°)    | 2438.3  | 4.9       | B3/2500                 |      |         |
| BM   | (30°-60°)   | 2743.2  | 5.5       | B3/5000                 |      |         |
| BH   | (60°-80°)   | 2174.1  | 4.3       | B3/2500                 |      | G3/2500 |
| BVH  | (80°-90°)   | 124.6   | 0.2       |                         |      | G2/225  |
| 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°    | 13862.5 | 13862.5 | 13862.5 | 13862.5 | 13862.5 | 13862.5 | 13862.5 | 13862.5 | 13862.5 | 13862.5 | 13862.5 |
| 2.5°  | 14230.2 | 14211.1 | 14218.0 | 14204.1 | 14171.0 | 14137.9 | 14089.1 | 14097.8 | 14029.8 | 13928.7 | 13803.2 |
| 5°    | 13961.8 | 13954.9 | 14007.1 | 14036.8 | 14061.2 | 14042.0 | 14028.1 | 14045.5 | 13946.1 | 13806.7 | 13588.9 |
| 7.5°  | 13398.9 | 13322.2 | 13388.4 | 13487.8 | 13581.9 | 13653.3 | 13747.5 | 13759.7 | 13696.9 | 13550.5 | 13264.7 |
| 10°   | 12598.9 | 12525.7 | 12623.3 | 12778.4 | 12966.7 | 13137.5 | 13327.4 | 13362.3 | 13374.5 | 13242.0 | 12895.2 |
| 12.5° | 11769.3 | 11713.6 | 11811.2 | 12029.0 | 12341.0 | 12604.2 | 12907.4 | 12959.7 | 13067.8 | 12978.9 | 12553.6 |
| 15°   | 11026.9 | 11006.0 | 11124.5 | 11338.9 | 11697.9 | 12100.5 | 12537.9 | 12633.8 | 12816.8 | 12787.2 | 12287.0 |
| 17.5° | 10385.5 | 10380.3 | 10470.9 | 10695.8 | 11093.1 | 11602.0 | 12170.2 | 12332.3 | 12604.2 | 12639.0 | 12067.4 |
| 20°   | 9908.0  | 9897.5  | 9960.3  | 10125.9 | 10535.4 | 11112.3 | 11772.8 | 11995.9 | 12388.0 | 12510.0 | 11840.8 |
| 22.5° | 9651.8  | 9650.1  | 9651.8  | 9730.2  | 10064.9 | 10601.6 | 11385.9 | 11657.8 | 12177.2 | 12407.2 | 11589.8 |
| 25°   | 9608.2  | 9603.0  | 9564.7  | 9555.9  | 9745.9  | 10174.7 | 11002.5 | 11302.3 | 11976.7 | 12335.8 | 11351.1 |
| 27.5° | 9721.5  | 9728.5  | 9677.9  | 9596.0  | 9634.4  | 9894.1  | 10669.6 | 10990.3 | 11816.4 | 12321.8 | 11185.5 |
| 30°   | 9956.8  | 9953.3  | 9909.7  | 9824.3  | 9749.4  | 9789.5  | 10432.6 | 10753.3 | 11708.3 | 12382.8 | 11072.2 |
| 32.5° | 10216.5 | 10235.7 | 10226.9 | 10179.9 | 10068.3 | 9908.0  | 10361.1 | 10674.8 | 11677.0 | 12529.2 | 11023.4 |
| 35°   | 10528.4 | 10549.4 | 10612.1 | 10648.7 | 10518.0 | 10260.1 | 10514.5 | 10786.4 | 11767.6 | 12804.6 | 11101.8 |
| 37.5° | 10824.7 | 10878.8 | 11054.8 | 11209.9 | 11098.4 | 10810.8 | 10922.3 | 11115.8 | 12048.2 | 13238.6 | 11312.7 |
| 40°   | 11166.3 | 11213.4 | 11500.9 | 11830.3 | 11812.9 | 11514.9 | 11579.4 | 11708.3 | 12543.2 | 13860.7 | 11694.4 |
| 42.5° | 11502.7 | 11596.8 | 12013.3 | 12480.4 | 12614.6 | 12351.5 | 12454.3 | 12522.2 | 13240.3 | 14685.1 | 12360.2 |
| 45°   | 11950.6 | 12051.7 | 12630.3 | 13193.2 | 13506.9 | 13358.8 | 13522.6 | 13548.8 | 14116.9 | 15807.5 | 13327.4 |
| 47.5° | 12628.6 | 12743.6 | 13418.1 | 14008.9 | 14488.2 | 14503.8 | 14774.0 | 14763.5 | 15211.4 | 17092.0 | 14545.7 |
| 50°   | 13684.7 | 13850.3 | 14402.8 | 14955.2 | 15537.3 | 15861.5 | 16222.3 | 16171.7 | 16523.8 | 18460.1 | 15948.7 |
| 52.5° | 15068.5 | 15145.2 | 15554.8 | 15962.6 | 16685.9 | 17412.6 | 17930.3 | 17884.9 | 18012.2 | 19866.5 | 17541.6 |
| 55°   | 16502.9 | 16560.4 | 16729.4 | 16952.5 | 17925.0 | 19110.2 | 20204.7 | 20133.2 | 19810.8 | 21327.0 | 19115.4 |
| 57.5° | 17792.6 | 17909.3 | 18026.1 | 18118.5 | 19172.9 | 20884.4 | 22531.3 | 22536.6 | 21762.7 | 22902.6 | 20741.4 |
| 60°   | 17993.0 | 18095.8 | 18867.9 | 19596.4 | 21307.9 | 23251.1 | 25021.8 | 24969.6 | 23782.7 | 24612.3 | 22554.0 |
| 62.5° | 15905.1 | 16136.9 | 17426.6 | 19364.6 | 23364.4 | 27580.3 | 28199.0 | 28134.5 | 26198.3 | 26719.4 | 24664.6 |
| 65°   | 11398.1 | 11661.3 | 13217.6 | 16129.9 | 22367.5 | 32350.4 | 33932.9 | 33065.0 | 29492.2 | 29310.9 | 27135.9 |
| 67.5° | 6575.7  | 6638.4  | 7312.9  | 9651.8  | 17031.0 | 32599.7 | 42680.2 | 41465.5 | 34607.4 | 32251.1 | 28345.4 |
| 70°   | 4862.5  | 4860.8  | 5021.1  | 5939.6  | 9216.1  | 26606.1 | 46840.4 | 47929.6 | 39992.8 | 33218.4 | 26635.7 |
| 71°   | 4397.2  | 4402.4  | 4581.9  | 5406.3  | 7299.0  | 22269.9 | 45956.7 | 48340.9 | 41411.4 | 32740.8 | 25398.3 |
| 72.5° | 3761.0  | 3778.5  | 4027.7  | 4848.6  | 6140.0  | 15357.8 | 42150.4 | 45873.1 | 42084.2 | 31562.7 | 23462.0 |
| 75°   | 2853.0  | 2893.1  | 3238.2  | 4086.9  | 5611.9  | 7788.7  | 30935.3 | 36630.8 | 37385.5 | 27850.5 | 17433.5 |
| 77.5° | 2035.6  | 2080.9  | 2471.3  | 3436.9  | 5334.8  | 5869.9  | 20717.0 | 26719.4 | 27512.3 | 17848.3 | 7863.7  |
| 80°   | 1286.2  | 1340.2  | 1634.8  | 2734.5  | 5012.4  | 5573.6  | 13019.0 | 17959.9 | 15002.3 | 5711.3  | 2000.8  |
| 82.5° | 754.6   | 796.5   | 1014.3  | 1786.4  | 4093.9  | 5367.9  | 7659.7  | 9955.1  | 5838.5  | 1725.4  | 909.8   |
| 85°   | 437.5   | 456.6   | 632.6   | 1138.1  | 2973.3  | 5066.4  | 5627.6  | 5564.9  | 2534.1  | 843.5   | 430.5   |
| 87.5° | 203.9   | 226.6   | 374.7   | 594.3   | 1650.5  | 3672.1  | 4447.7  | 3842.9  | 1575.5  | 395.6   | 202.2   |
| 90°   | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |



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**CANDELA DISTRIBUTION (continued):**

|       | 90°     | 95°     | 105°    | 115°    | 125°    | 135°    | 145°    | 155°    | 165°    | 175°    | 180°    |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 13862.5 | 13862.5 | 13862.5 | 13862.5 | 13862.5 | 13862.5 | 13862.5 | 13862.5 | 13862.5 | 13862.5 | 13862.5 |
| 2.5°  | 13742.2 | 13712.6 | 13588.9 | 13479.1 | 13364.0 | 13214.2 | 13048.6 | 13027.7 | 12926.6 | 12945.8 | 12910.9 |
| 5°    | 13470.3 | 13395.4 | 13097.4 | 12827.2 | 12508.3 | 12222.5 | 11912.3 | 11769.3 | 11563.7 | 11549.7 | 11497.5 |
| 7.5°  | 13081.7 | 12942.3 | 12480.4 | 11968.0 | 11455.6 | 10967.6 | 10484.9 | 10167.7 | 9843.5  | 9705.8  | 9693.6  |
| 10°   | 12644.2 | 12407.2 | 11727.5 | 10969.4 | 10230.4 | 9517.6  | 8827.4  | 8316.8  | 7856.7  | 7638.8  | 7630.1  |
| 12.5° | 12229.5 | 11879.1 | 10946.7 | 9915.0  | 8904.1  | 7980.4  | 7034.1  | 6363.1  | 5786.2  | 5592.7  | 5510.8  |
| 15°   | 11877.4 | 11384.2 | 10186.9 | 8867.5  | 7640.6  | 6357.9  | 5280.8  | 4574.9  | 4041.6  | 3856.9  | 3822.0  |
| 17.5° | 11535.8 | 10901.4 | 9407.8  | 7809.6  | 6326.5  | 4916.5  | 3837.7  | 3313.1  | 3029.0  | 2954.1  | 2952.4  |
| 20°   | 11196.0 | 10404.7 | 8593.9  | 6727.3  | 5056.0  | 3677.4  | 2950.6  | 2715.3  | 2619.5  | 2610.8  | 2596.8  |
| 22.5° | 10810.8 | 9878.4  | 7738.2  | 5641.5  | 3945.8  | 2891.4  | 2507.9  | 2413.8  | 2401.6  | 2433.0  | 2433.0  |
| 25°   | 10450.0 | 9355.5  | 6870.2  | 4578.4  | 3069.1  | 2412.1  | 2239.5  | 2220.4  | 2253.5  | 2309.3  | 2314.5  |
| 27.5° | 10113.7 | 8851.8  | 6023.2  | 3633.8  | 2459.1  | 2124.5  | 2053.1  | 2075.7  | 2135.0  | 2199.5  | 2201.2  |
| 30°   | 9836.5  | 8376.1  | 5200.6  | 2863.5  | 2077.5  | 1910.1  | 1897.9  | 1943.3  | 2007.7  | 2058.3  | 2070.5  |
| 32.5° | 9622.2  | 7970.0  | 4405.9  | 2302.3  | 1828.2  | 1749.8  | 1760.3  | 1798.6  | 1838.7  | 1866.6  | 1885.7  |
| 35°   | 9522.8  | 7621.4  | 3672.1  | 1941.5  | 1669.6  | 1626.1  | 1640.0  | 1660.9  | 1678.3  | 1699.3  | 1714.9  |
| 37.5° | 9540.3  | 7351.3  | 3016.8  | 1716.7  | 1563.3  | 1540.7  | 1540.7  | 1540.7  | 1540.7  | 1551.1  | 1552.9  |
| 40°   | 9702.3  | 7196.2  | 2483.5  | 1573.8  | 1491.9  | 1467.5  | 1448.3  | 1430.9  | 1416.9  | 1423.9  | 1420.4  |
| 42.5° | 10117.1 | 7182.2  | 2093.1  | 1483.2  | 1434.4  | 1394.3  | 1355.9  | 1331.5  | 1314.1  | 1321.1  | 1324.6  |
| 45°   | 10821.2 | 7356.5  | 1830.0  | 1418.7  | 1380.3  | 1319.3  | 1270.5  | 1244.4  | 1232.2  | 1254.8  | 1258.3  |
| 47.5° | 11732.7 | 7736.4  | 1669.6  | 1371.6  | 1329.8  | 1249.6  | 1197.3  | 1172.9  | 1176.4  | 1209.5  | 1218.2  |
| 50°   | 12907.4 | 8353.4  | 1592.9  | 1342.0  | 1294.9  | 1190.4  | 1136.3  | 1115.4  | 1125.9  | 1172.9  | 1183.4  |
| 52.5° | 14197.1 | 9242.2  | 1601.7  | 1333.3  | 1272.3  | 1146.8  | 1089.3  | 1064.9  | 1082.3  | 1125.9  | 1134.6  |
| 55°   | 15685.5 | 10310.6 | 1746.3  | 1345.5  | 1239.2  | 1118.9  | 1050.9  | 1009.1  | 1023.0  | 1063.1  | 1070.1  |
| 57.5° | 17339.4 | 11534.1 | 2037.4  | 1342.0  | 1197.3  | 1092.8  | 1010.8  | 948.1   | 958.6   | 983.0   | 989.9   |
| 60°   | 19061.4 | 13012.0 | 2488.8  | 1352.4  | 1178.2  | 1061.4  | 956.8   | 878.4   | 874.9   | 895.8   | 899.3   |
| 62.5° | 21128.4 | 14721.7 | 3004.6  | 1359.4  | 1190.4  | 1021.3  | 885.4   | 808.7   | 798.2   | 803.4   | 806.9   |
| 65°   | 23258.1 | 15959.1 | 2811.2  | 1331.5  | 1228.7  | 988.2   | 822.6   | 740.7   | 721.5   | 718.0   | 719.8   |
| 67.5° | 23324.3 | 14632.8 | 1971.1  | 1275.8  | 1244.4  | 970.8   | 775.6   | 683.2   | 651.8   | 639.6   | 637.9   |
| 70°   | 20917.5 | 11887.9 | 1535.4  | 1216.5  | 1181.6  | 942.9   | 732.0   | 636.1   | 589.1   | 569.9   | 568.2   |
| 71°   | 19742.8 | 10943.2 | 1455.3  | 1186.9  | 1134.6  | 915.0   | 712.8   | 615.2   | 566.4   | 545.5   | 542.0   |
| 72.5° | 17900.6 | 9810.4  | 1357.7  | 1139.8  | 1044.0  | 843.5   | 676.2   | 585.6   | 535.0   | 510.6   | 505.4   |
| 75°   | 12846.4 | 6415.4  | 1166.0  | 1016.1  | 864.4   | 672.7   | 592.6   | 526.3   | 482.8   | 453.1   | 449.7   |
| 77.5° | 4949.6  | 2553.2  | 881.9   | 845.3   | 662.3   | 526.3   | 488.0   | 454.9   | 423.5   | 393.9   | 392.1   |
| 80°   | 1530.2  | 1141.6  | 643.1   | 636.1   | 479.3   | 392.1   | 379.9   | 371.2   | 359.0   | 327.7   | 320.7   |
| 82.5° | 817.4   | 655.3   | 442.7   | 411.3   | 313.7   | 261.4   | 275.4   | 278.9   | 280.6   | 247.5   | 244.0   |
| 85°   | 390.4   | 346.8   | 249.2   | 233.5   | 183.0   | 146.4   | 169.1   | 183.0   | 184.7   | 151.6   | 141.2   |
| 87.5° | 186.5   | 181.3   | 116.8   | 88.9    | 68.0    | 48.8    | 59.3    | 73.2    | 80.2    | 57.5    | 50.5    |
| 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

REPORT NUMBER: SP1-2101-121-2

### 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

| 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            | 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              |           |                  |                  |

REPORT NUMBER: SP1-2101-121-2

### 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              |           |                  |                  |

### 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)