

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: P319365

Luminaire Tested: **GLEON-SA1C-740-U-SL2**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P319365  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-20)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: MCGRAW-EDISON  
Catalog Number: GLEON-SA1C-740-U-SL2  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(1) 70 CRI, 4000K, 1050mA LIGHTSQUARE WITH 16 LEDS AND TYPE II SPILL  
LIGHT ELIMINATOR OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 7254 lumens  
Efficiency: N/A  
Efficacy: 122.9 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 0.5' x H: 0')  
IES Classification: Type III - Medium  
BUG Rating: B1 - U0 - G2

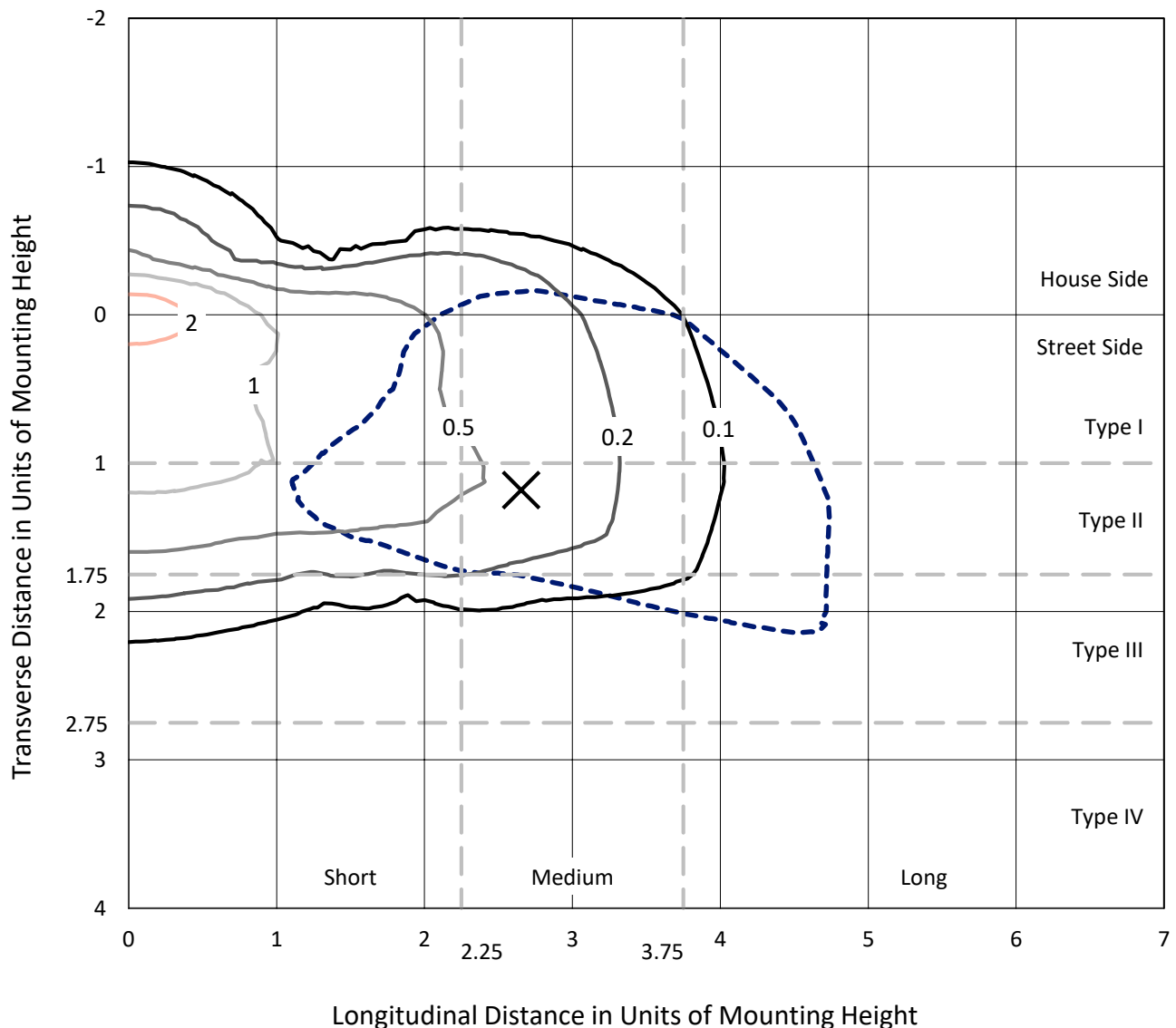
Input Watts (W): 59  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



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 CATALOG NUMBER: GLEON-SA1C-740-U-SL2

## Iso-Footcandle Lines of Horizontal Illumination

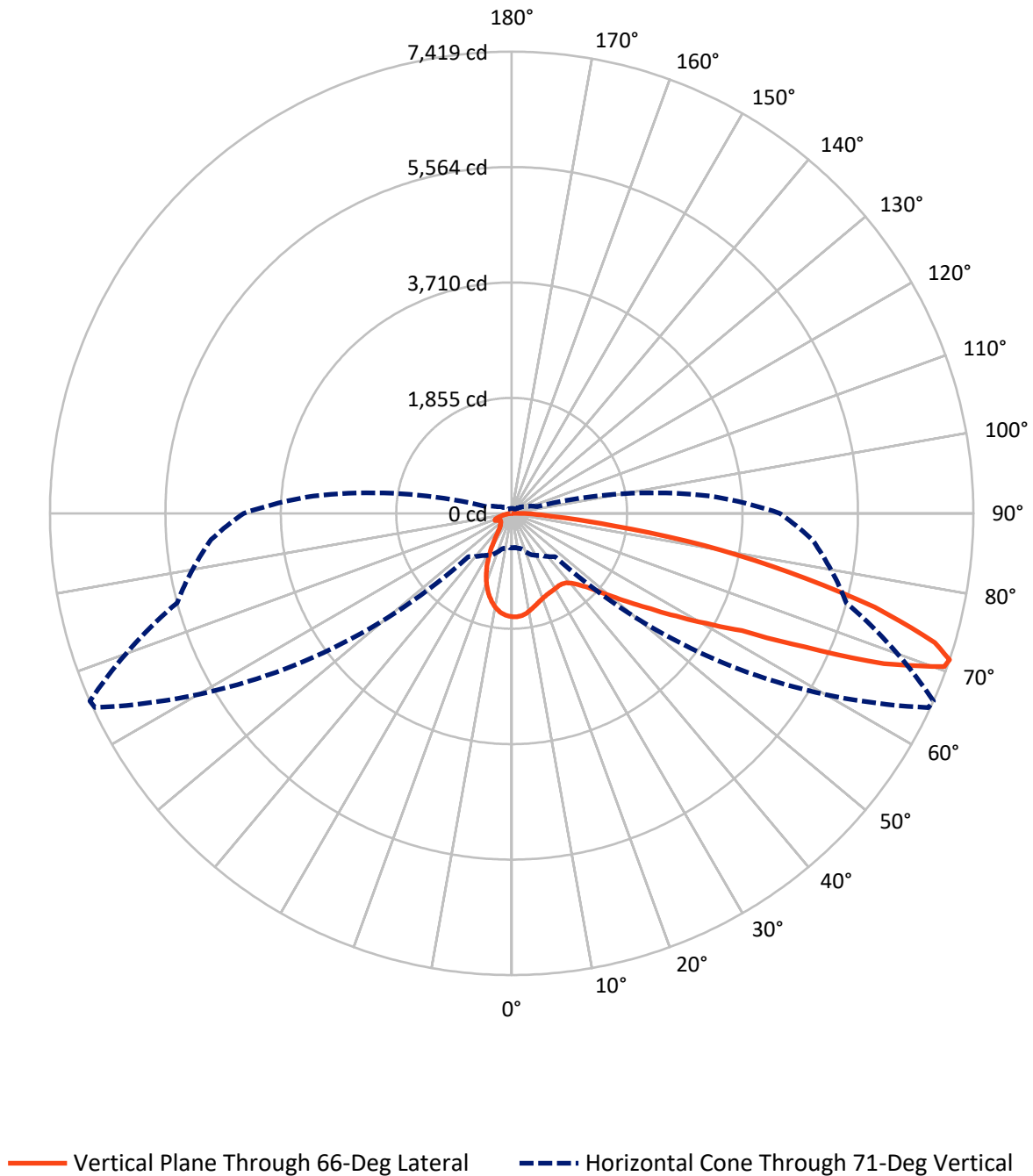
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 2.7 fc  
 Type III - Medium - N/A

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## Luminous Intensity Polar Plot



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CATALOG NUMBER: GLEON-SA1C-740-U-SL2

**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 1344.4   | 0.0    | 1344.4 |
|                    | % Fixture | 18.5     | 0.0    | 18.5   |
| <b>Street Side</b> | Lumens    | 5909.6   | 0.0    | 5909.6 |
|                    | % Fixture | 81.5     | 0.0    | 81.5   |
| <b>Total</b>       | Lumens    | 7254.0   | 0.0    | 7254.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 146.3  | 2.0       |
| 10°-20°   | 350.8  | 4.8       |
| 20°-30°   | 471.3  | 6.5       |
| 30°-40°   | 619.9  | 8.5       |
| 40°-50°   | 901.8  | 12.4      |
| 50°-60°   | 1408.7 | 19.4      |
| 60°-70°   | 1764.7 | 24.3      |
| 70°-80°   | 1346.1 | 18.6      |
| 80°-90°   | 244.4  | 3.4       |
| 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°    | 7254.0 | 100.0     |
| 0°-180°   | 7254.0 | 100.0     |

**Coefficient of Utilization**



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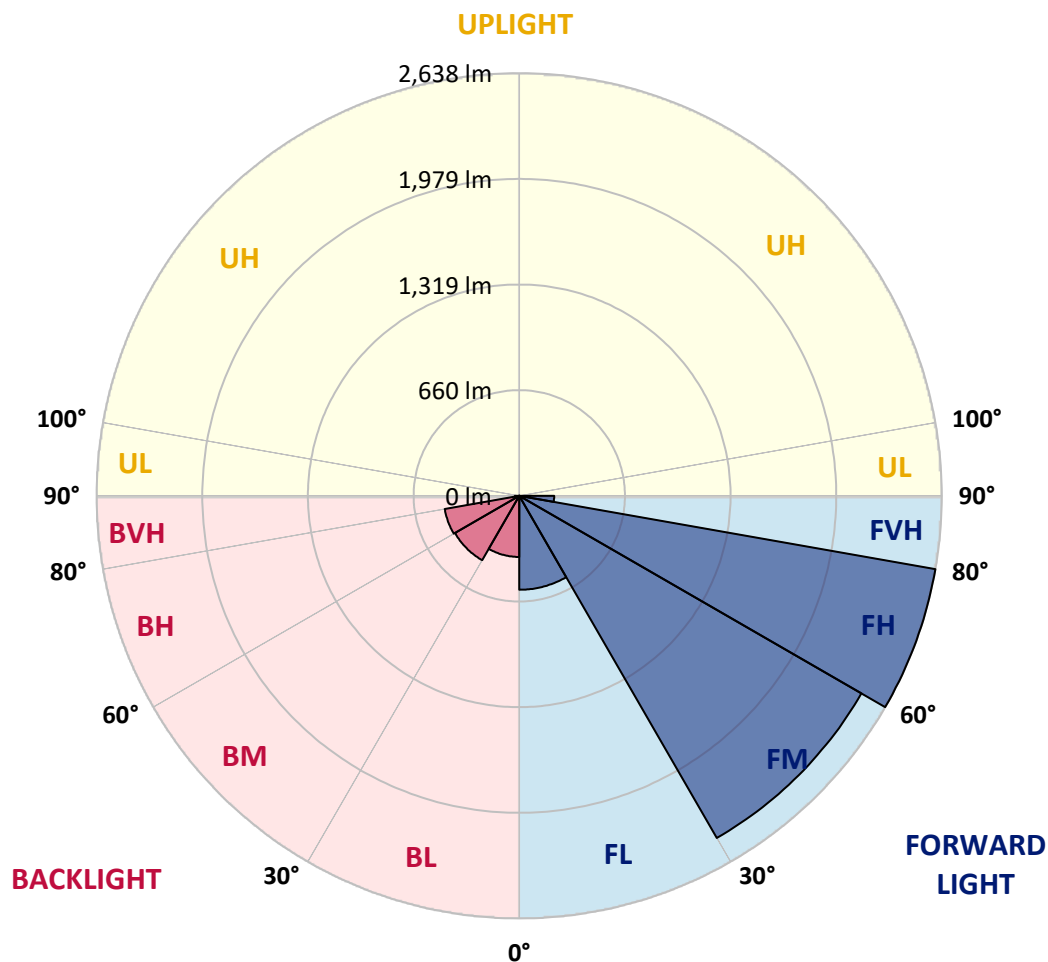
CATALOG NUMBER: GLEON-SA1C-740-U-SL2

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 586.6  | 8.1       |                         |      |         |
| FM   | (30°-60°)   | 2466.7 | 34.0      |                         |      |         |
| FH   | (60°-80°)   | 2638.4 | 36.4      |                         |      | G2/5000 |
| FVH  | (80°-90°)   | 218.0  | 3.0       |                         |      | G2/225  |
| BL   | (0°-30°)    | 381.8  | 5.3       | B1/500                  |      |         |
| BM   | (30°-60°)   | 463.8  | 6.4       | B1/1000                 |      |         |
| BH   | (60°-80°)   | 472.4  | 6.5       | B1/500                  |      | G1/500  |
| BVH  | (80°-90°)   | 26.5   | 0.4       |                         |      | G1/100  |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B1-U0-G2**

Type III Medium





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 65°    | 66°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1661.8 | 1661.8 | 1661.8 | 1661.8 | 1661.8 | 1661.8 | 1661.8 | 1661.8 | 1661.8 | 1661.8 | 1661.8 |
| 2.5°  | 1630.9 | 1628.4 | 1636.0 | 1643.7 | 1646.7 | 1651.7 | 1659.2 | 1663.5 | 1663.3 | 1664.0 | 1661.5 |
| 5°    | 1522.7 | 1519.5 | 1534.5 | 1546.8 | 1570.3 | 1596.9 | 1629.2 | 1652.2 | 1652.7 | 1665.8 | 1669.3 |
| 7.5°  | 1420.3 | 1418.1 | 1435.3 | 1455.1 | 1482.4 | 1523.0 | 1575.3 | 1624.9 | 1627.9 | 1663.3 | 1675.5 |
| 10°   | 1338.2 | 1337.7 | 1354.4 | 1376.0 | 1407.8 | 1453.1 | 1513.2 | 1585.9 | 1590.4 | 1651.2 | 1676.5 |
| 12.5° | 1274.1 | 1275.1 | 1289.6 | 1314.1 | 1347.7 | 1395.0 | 1460.1 | 1542.0 | 1549.3 | 1632.2 | 1670.8 |
| 15°   | 1226.7 | 1230.7 | 1242.5 | 1267.3 | 1300.3 | 1348.4 | 1415.3 | 1501.5 | 1512.5 | 1610.9 | 1667.5 |
| 17.5° | 1199.7 | 1204.2 | 1212.4 | 1233.0 | 1264.0 | 1310.4 | 1373.7 | 1468.2 | 1478.2 | 1594.6 | 1667.8 |
| 20°   | 1191.7 | 1195.4 | 1200.2 | 1212.7 | 1239.0 | 1281.1 | 1340.9 | 1438.1 | 1448.9 | 1581.6 | 1670.3 |
| 22.5° | 1207.4 | 1210.2 | 1210.7 | 1209.7 | 1225.7 | 1260.0 | 1317.1 | 1416.1 | 1427.6 | 1573.1 | 1672.0 |
| 25°   | 1241.2 | 1245.0 | 1242.2 | 1233.0 | 1227.7 | 1248.8 | 1304.9 | 1401.5 | 1413.1 | 1566.8 | 1668.5 |
| 27.5° | 1292.1 | 1292.6 | 1290.3 | 1278.3 | 1253.5 | 1250.0 | 1301.1 | 1393.0 | 1404.0 | 1559.6 | 1661.3 |
| 30°   | 1361.2 | 1364.5 | 1360.5 | 1344.2 | 1303.6 | 1270.0 | 1305.6 | 1384.8 | 1394.8 | 1550.3 | 1649.5 |
| 32.5° | 1442.1 | 1450.1 | 1449.9 | 1432.8 | 1374.7 | 1314.9 | 1324.1 | 1379.7 | 1387.5 | 1540.5 | 1635.2 |
| 35°   | 1526.0 | 1537.0 | 1557.6 | 1550.3 | 1478.4 | 1385.8 | 1359.7 | 1387.8 | 1393.0 | 1539.3 | 1625.2 |
| 37.5° | 1613.2 | 1624.2 | 1666.5 | 1686.0 | 1601.9 | 1487.2 | 1415.8 | 1416.1 | 1418.6 | 1554.6 | 1624.4 |
| 40°   | 1704.3 | 1716.1 | 1779.7 | 1830.6 | 1761.9 | 1615.7 | 1506.2 | 1475.2 | 1472.4 | 1592.1 | 1639.2 |
| 42.5° | 1832.1 | 1842.6 | 1919.0 | 1983.8 | 1939.5 | 1780.2 | 1631.2 | 1566.3 | 1560.6 | 1665.8 | 1686.5 |
| 45°   | 1993.6 | 2002.6 | 2083.8 | 2153.1 | 2130.3 | 1968.1 | 1788.2 | 1691.8 | 1690.8 | 1788.5 | 1782.5 |
| 47.5° | 2185.7 | 2192.7 | 2265.6 | 2332.7 | 2341.0 | 2184.2 | 1985.6 | 1885.4 | 1869.1 | 1956.8 | 1931.0 |
| 50°   | 2385.8 | 2393.6 | 2443.2 | 2515.3 | 2576.7 | 2473.5 | 2239.5 | 2122.6 | 2100.8 | 2178.9 | 2141.4 |
| 52.5° | 2518.3 | 2528.6 | 2571.6 | 2663.1 | 2841.6 | 2790.5 | 2539.8 | 2410.1 | 2377.0 | 2448.2 | 2419.4 |
| 55°   | 2459.2 | 2482.2 | 2548.1 | 2694.6 | 3053.5 | 3274.9 | 2910.3 | 2745.5 | 2708.1 | 2767.2 | 2750.2 |
| 57.5° | 2190.5 | 2222.0 | 2311.9 | 2538.1 | 3083.3 | 3701.7 | 3470.3 | 3140.4 | 3114.1 | 3097.1 | 3104.9 |
| 60°   | 1699.3 | 1729.6 | 1841.1 | 2135.9 | 2875.7 | 4013.2 | 4313.0 | 3627.3 | 3589.2 | 3428.2 | 3435.2 |
| 62.5° | 1202.7 | 1187.4 | 1263.8 | 1479.4 | 2336.7 | 4049.8 | 5272.0 | 4278.5 | 4153.3 | 3777.8 | 3747.0 |
| 65°   | 917.2  | 913.6  | 948.0  | 1016.6 | 1415.3 | 3612.3 | 5843.3 | 5373.0 | 5177.3 | 4189.1 | 4116.4 |
| 67.5° | 753.6  | 747.3  | 781.2  | 881.1  | 911.4  | 2330.5 | 5855.8 | 6642.7 | 6450.6 | 4701.0 | 4543.7 |
| 70°   | 619.6  | 612.6  | 644.2  | 773.1  | 842.3  | 1181.9 | 4928.4 | 7386.3 | 7376.1 | 5349.2 | 4866.3 |
| 71°   | 555.5  | 550.5  | 588.3  | 731.6  | 827.5  | 985.0  | 4255.2 | 7388.3 | 7419.1 | 5568.6 | 4847.3 |
| 72.5° | 452.3  | 454.1  | 494.1  | 651.2  | 816.5  | 869.8  | 3127.4 | 7044.0 | 7109.1 | 5777.7 | 4674.2 |
| 75°   | 300.5  | 302.0  | 354.6  | 500.9  | 791.7  | 851.0  | 1718.9 | 5910.7 | 6030.4 | 5652.5 | 4265.2 |
| 77.5° | 201.9  | 201.4  | 237.2  | 343.6  | 689.7  | 851.0  | 1007.8 | 4420.7 | 4552.2 | 4497.6 | 3288.2 |
| 80°   | 139.0  | 138.0  | 163.3  | 237.2  | 522.2  | 861.3  | 779.2  | 3098.1 | 3137.9 | 2428.9 | 1336.4 |
| 82.5° | 85.2   | 85.9   | 106.7  | 167.6  | 355.4  | 775.1  | 735.6  | 1689.3 | 1646.0 | 681.2  | 333.9  |
| 85°   | 48.8   | 48.6   | 68.1   | 113.5  | 228.2  | 654.2  | 717.3  | 727.1  | 667.0  | 205.1  | 120.7  |
| 87.5° | 17.5   | 18.8   | 36.6   | 62.9   | 130.7  | 455.6  | 608.6  | 378.2  | 340.9  | 92.7   | 54.6   |
| 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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CATALOG NUMBER: GLEON-SA1C-740-U-SL2

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1661.8 | 1661.8 | 1661.8 | 1661.8 | 1661.8 | 1661.8 | 1661.8 | 1661.8 | 1661.8 | 1661.8 | 1661.8 |
| 2.5°  | 1659.7 | 1661.3 | 1659.5 | 1649.5 | 1641.0 | 1627.2 | 1619.4 | 1608.7 | 1605.4 | 1603.9 | 1607.9 |
| 5°    | 1666.0 | 1666.5 | 1651.7 | 1625.4 | 1595.9 | 1561.1 | 1536.0 | 1505.2 | 1490.7 | 1484.4 | 1488.4 |
| 7.5°  | 1671.8 | 1669.5 | 1637.2 | 1586.9 | 1532.3 | 1471.7 | 1417.8 | 1368.5 | 1339.7 | 1327.9 | 1328.9 |
| 10°   | 1672.5 | 1663.0 | 1611.2 | 1533.3 | 1448.6 | 1359.7 | 1277.1 | 1200.9 | 1152.8 | 1121.5 | 1131.0 |
| 12.5° | 1664.8 | 1648.7 | 1572.8 | 1463.9 | 1346.4 | 1225.2 | 1113.5 | 999.3  | 930.7  | 898.9  | 899.9  |
| 15°   | 1658.7 | 1629.7 | 1525.8 | 1382.2 | 1224.5 | 1063.9 | 911.4  | 777.2  | 704.0  | 671.5  | 656.2  |
| 17.5° | 1653.7 | 1609.2 | 1471.2 | 1290.3 | 1080.5 | 876.8  | 693.5  | 573.8  | 533.7  | 524.2  | 520.2  |
| 20°   | 1646.7 | 1587.4 | 1410.3 | 1183.9 | 916.4  | 667.5  | 506.4  | 447.3  | 447.6  | 458.6  | 460.1  |
| 22.5° | 1637.0 | 1562.6 | 1345.4 | 1064.4 | 740.3  | 486.1  | 397.0  | 379.9  | 397.2  | 418.3  | 422.0  |
| 25°   | 1622.4 | 1533.3 | 1273.3 | 932.4  | 564.5  | 373.7  | 339.1  | 338.4  | 359.4  | 381.4  | 384.7  |
| 27.5° | 1601.9 | 1494.9 | 1193.2 | 790.7  | 416.0  | 317.6  | 303.8  | 309.1  | 324.6  | 340.6  | 341.9  |
| 30°   | 1574.3 | 1450.4 | 1104.7 | 641.2  | 326.1  | 282.8  | 281.3  | 286.0  | 295.5  | 306.8  | 307.8  |
| 32.5° | 1544.0 | 1405.0 | 1010.3 | 496.4  | 279.3  | 264.0  | 265.5  | 267.7  | 272.2  | 276.7  | 277.8  |
| 35°   | 1516.5 | 1358.7 | 913.6  | 377.2  | 257.0  | 251.7  | 250.7  | 250.2  | 250.7  | 249.2  | 249.5  |
| 37.5° | 1498.7 | 1320.4 | 813.0  | 300.3  | 244.2  | 240.9  | 237.9  | 234.2  | 229.9  | 227.4  | 227.9  |
| 40°   | 1492.2 | 1291.8 | 711.0  | 259.5  | 233.7  | 231.4  | 225.7  | 217.6  | 212.6  | 211.1  | 211.1  |
| 42.5° | 1509.7 | 1277.1 | 612.6  | 238.9  | 224.9  | 221.1  | 211.6  | 202.4  | 198.6  | 198.4  | 198.1  |
| 45°   | 1563.3 | 1283.1 | 518.9  | 227.7  | 216.9  | 209.6  | 197.1  | 189.3  | 186.8  | 187.3  | 187.1  |
| 47.5° | 1659.5 | 1320.9 | 438.8  | 220.1  | 208.9  | 199.4  | 185.3  | 179.1  | 176.1  | 176.1  | 176.3  |
| 50°   | 1823.0 | 1409.3 | 374.9  | 213.9  | 202.1  | 189.8  | 176.8  | 169.1  | 165.0  | 164.8  | 164.8  |
| 52.5° | 2061.2 | 1567.6 | 335.1  | 208.6  | 194.6  | 181.3  | 168.3  | 158.5  | 153.8  | 152.8  | 152.3  |
| 55°   | 2359.8 | 1794.5 | 324.1  | 205.1  | 184.6  | 172.1  | 158.0  | 148.3  | 143.0  | 140.8  | 140.5  |
| 57.5° | 2693.6 | 2070.5 | 345.9  | 200.9  | 174.3  | 161.0  | 146.8  | 137.5  | 132.0  | 129.2  | 129.0  |
| 60°   | 3031.5 | 2371.8 | 434.8  | 194.9  | 165.8  | 149.0  | 135.2  | 126.7  | 121.2  | 118.2  | 117.7  |
| 62.5° | 3369.8 | 2689.4 | 616.4  | 194.4  | 159.8  | 137.5  | 123.5  | 116.2  | 111.0  | 107.7  | 106.9  |
| 65°   | 3751.5 | 3037.0 | 822.7  | 207.6  | 157.8  | 127.0  | 111.5  | 105.7  | 101.2  | 98.2   | 97.9   |
| 67.5° | 4189.8 | 3429.4 | 803.0  | 234.9  | 164.5  | 117.5  | 100.2  | 95.7   | 92.4   | 89.9   | 89.7   |
| 70°   | 4395.4 | 3368.1 | 499.2  | 254.2  | 174.1  | 108.2  | 89.4   | 86.2   | 83.7   | 81.9   | 81.1   |
| 71°   | 4309.3 | 3198.0 | 418.5  | 252.0  | 173.1  | 104.2  | 85.2   | 82.6   | 80.1   | 78.6   | 77.9   |
| 72.5° | 4074.4 | 2916.5 | 349.1  | 234.4  | 161.8  | 96.9   | 79.6   | 77.1   | 74.9   | 73.1   | 72.6   |
| 75°   | 3656.1 | 2604.7 | 279.5  | 187.3  | 129.0  | 81.9   | 69.9   | 67.1   | 65.4   | 64.4   | 63.4   |
| 77.5° | 2687.6 | 1858.9 | 216.1  | 148.0  | 94.9   | 66.9   | 59.6   | 57.6   | 55.9   | 54.3   | 53.6   |
| 80°   | 1029.6 | 720.1  | 145.5  | 110.4  | 69.6   | 52.8   | 48.1   | 47.1   | 45.3   | 44.3   | 44.3   |
| 82.5° | 277.3  | 215.1  | 77.6   | 66.9   | 46.6   | 38.6   | 36.8   | 36.3   | 34.8   | 32.8   | 33.1   |
| 85°   | 112.2  | 94.9   | 43.6   | 36.8   | 28.6   | 22.8   | 24.8   | 25.0   | 23.3   | 20.8   | 21.0   |
| 87.5° | 49.3   | 40.3   | 24.3   | 16.3   | 12.5   | 8.8    | 11.3   | 11.3   | 10.3   | 8.5    | 7.8    |
| 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

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| 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



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| 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)