

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: P386846

Luminaire Tested: **GWC-SA2C-740-U-T3-HSS**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P386846  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-15)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GWC-SA2C-740-U-T3-HSS  
Description: GALLEON WALL LUMINAIRE  
(2) 70 CRI, 4000K, 1050mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE III  
OPTICS WITH HOUSE SIDE SHIELD  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 10758 lumens  
Efficiency: N/A  
Efficacy: 95.2 lumens/watt  
Luminous Opening: Rectangular (W 1' x L: 0.5' x H: 0')  
IES Classification: Type III - Short  
BUG Rating: B1 - U0 - G2

Input Watts (W): 113  
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: 28.75 FT

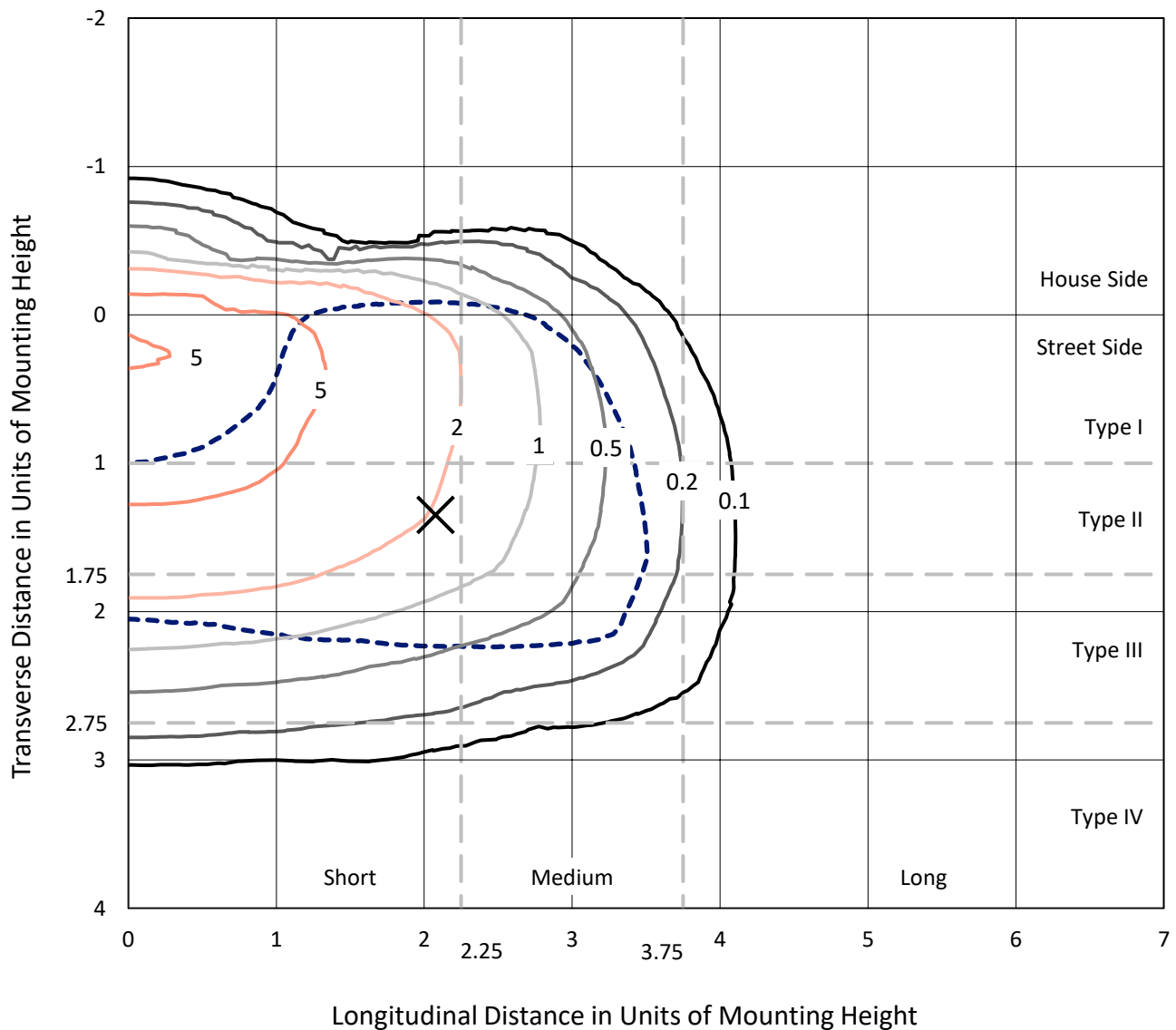


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## Iso-Footcandle Lines of Horizontal Illumination

✕ Max cd  
 - - - 1/2 Max cd

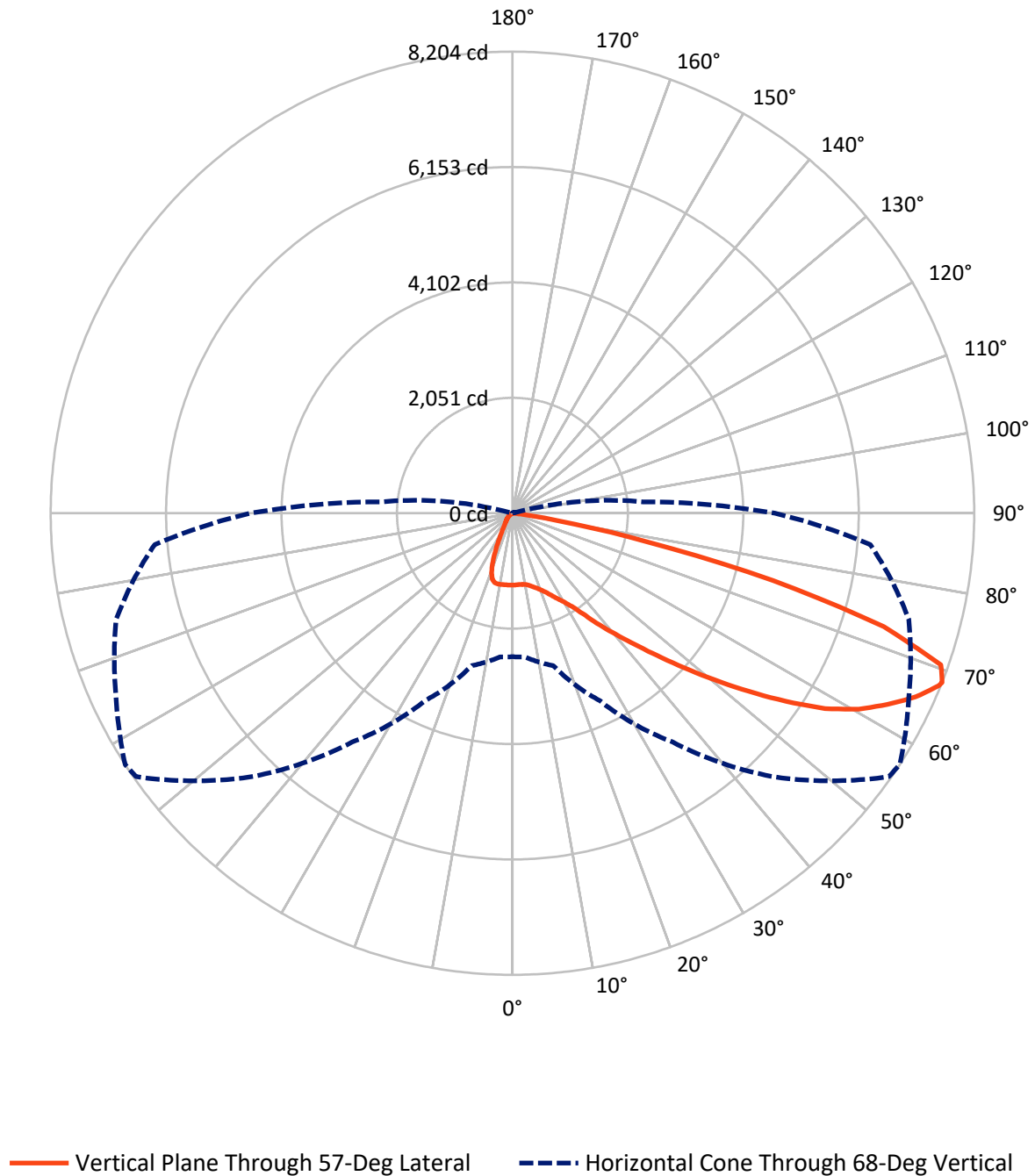


Based on 15 foot mounting height. Maximum calculated value = 7.3 fc  
 Type III - Short - N/A

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CATALOG NUMBER: GWC-SA2C-740-U-T3-HSS

## Luminous Intensity Polar Plot



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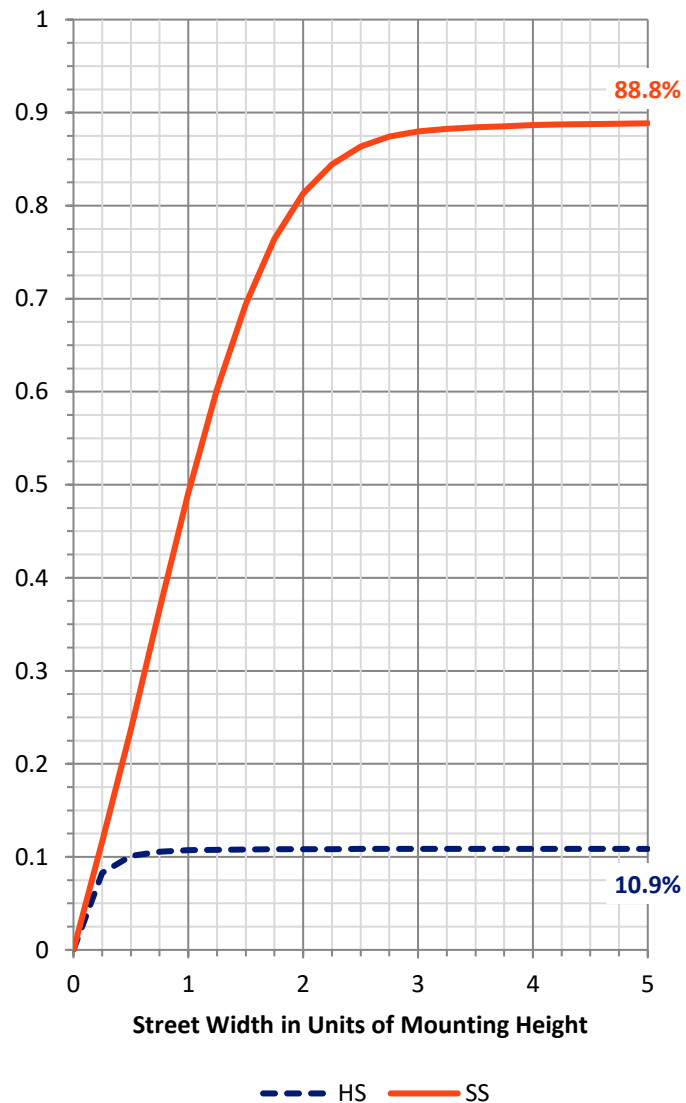
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 1179.7   | 0.0    | 1179.7  |
|                    | % Fixture | 11.0     | 0.0    | 11.0    |
| <b>Street Side</b> | Lumens    | 9578.3   | 0.0    | 9578.3  |
|                    | % Fixture | 89.0     | 0.0    | 89.0    |
| <b>Total</b>       | Lumens    | 10758.0  | 0.0    | 10758.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 119.6   | 1.1       |
| 10°-20°   | 331.5   | 3.1       |
| 20°-30°   | 571.9   | 5.3       |
| 30°-40°   | 987.1   | 9.2       |
| 40°-50°   | 1688.4  | 15.7      |
| 50°-60°   | 2701.2  | 25.1      |
| 60°-70°   | 3121.0  | 29.0      |
| 70°-80°   | 1192.6  | 11.1      |
| 80°-90°   | 44.7    | 0.4       |
| 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°    | 10758.0 | 100.0     |
| 0°-180°   | 10758.0 | 100.0     |

**Coefficient of Utilization**



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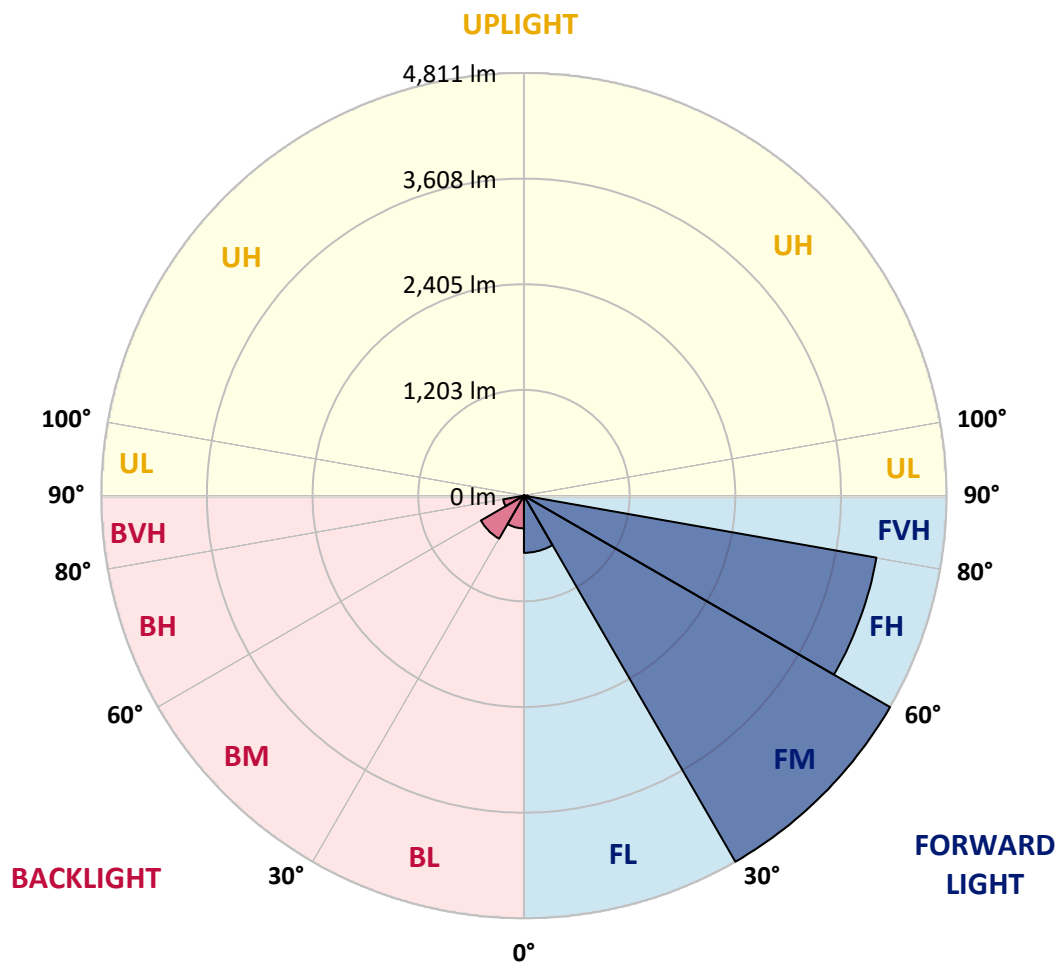
CATALOG NUMBER: GWC-SA2C-740-U-T3-HSS

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 650.2  | 6.0       |                         |      |         |
| FM   | (30°-60°)   | 4810.9 | 44.7      |                         |      |         |
| FH   | (60°-80°)   | 4073.3 | 37.9      |                         |      | G2/5000 |
| FVH  | (80°-90°)   | 43.9   | 0.4       |                         |      | G1/100  |
| BL   | (0°-30°)    | 372.8  | 3.5       | B1/500                  |      |         |
| BM   | (30°-60°)   | 565.8  | 5.3       | B1/1000                 |      |         |
| BH   | (60°-80°)   | 240.3  | 2.2       | B1/500                  |      | G1/500  |
| BVH  | (80°-90°)   | 0.8    | 0.0       |                         |      | G0/10   |
| 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 Short



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 57°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1278.3 | 1278.3 | 1278.3 | 1278.3 | 1278.3 | 1278.3 | 1278.3 | 1278.3 | 1278.3 | 1278.3 | 1278.3 |
| 2.5°  | 1248.3 | 1253.9 | 1258.0 | 1260.5 | 1263.6 | 1270.2 | 1272.2 | 1275.3 | 1276.8 | 1276.8 | 1280.4 |
| 5°    | 1199.0 | 1205.1 | 1213.7 | 1220.9 | 1235.1 | 1253.4 | 1266.6 | 1271.7 | 1280.9 | 1289.0 | 1293.6 |
| 7.5°  | 1153.2 | 1160.3 | 1170.5 | 1187.3 | 1211.7 | 1241.2 | 1268.7 | 1275.8 | 1293.6 | 1310.9 | 1319.5 |
| 10°   | 1123.7 | 1129.3 | 1142.5 | 1166.4 | 1198.5 | 1239.7 | 1278.3 | 1287.0 | 1317.5 | 1346.5 | 1362.8 |
| 12.5° | 1113.5 | 1118.6 | 1132.3 | 1159.3 | 1199.0 | 1247.3 | 1300.7 | 1313.4 | 1358.2 | 1400.4 | 1423.3 |
| 15°   | 1128.3 | 1129.3 | 1144.0 | 1169.5 | 1208.6 | 1266.1 | 1337.9 | 1353.1 | 1409.6 | 1464.5 | 1493.0 |
| 17.5° | 1185.2 | 1180.7 | 1188.3 | 1199.5 | 1230.5 | 1291.1 | 1377.0 | 1399.9 | 1475.2 | 1539.8 | 1566.8 |
| 20°   | 1327.7 | 1327.7 | 1310.4 | 1279.9 | 1280.4 | 1329.7 | 1429.9 | 1455.9 | 1547.9 | 1622.7 | 1647.1 |
| 22.5° | 1571.3 | 1566.8 | 1532.2 | 1457.4 | 1388.7 | 1396.3 | 1494.5 | 1528.1 | 1635.4 | 1715.3 | 1723.4 |
| 25°   | 1864.3 | 1858.7 | 1805.3 | 1700.0 | 1581.0 | 1504.2 | 1582.0 | 1620.7 | 1739.7 | 1810.4 | 1793.6 |
| 27.5° | 2174.6 | 2170.1 | 2117.2 | 1986.4 | 1817.0 | 1676.1 | 1686.3 | 1722.9 | 1846.0 | 1915.7 | 1862.3 |
| 30°   | 2475.3 | 2476.8 | 2424.4 | 2290.1 | 2098.3 | 1895.4 | 1818.6 | 1839.9 | 1949.3 | 2020.0 | 1943.7 |
| 32.5° | 2761.2 | 2763.2 | 2717.9 | 2567.9 | 2388.8 | 2150.2 | 2001.7 | 1996.1 | 2069.3 | 2139.0 | 2051.5 |
| 35°   | 3016.0 | 3021.1 | 2990.1 | 2873.6 | 2683.8 | 2434.1 | 2239.2 | 2226.0 | 2239.8 | 2318.6 | 2216.9 |
| 37.5° | 3261.7 | 3264.8 | 3241.4 | 3143.2 | 2984.5 | 2745.9 | 2539.4 | 2520.6 | 2491.0 | 2551.6 | 2435.1 |
| 40°   | 3530.8 | 3523.2 | 3496.2 | 3407.2 | 3270.9 | 3090.3 | 2861.9 | 2829.3 | 2777.9 | 2831.9 | 2722.0 |
| 42.5° | 3781.1 | 3772.4 | 3777.0 | 3676.3 | 3561.3 | 3444.3 | 3237.8 | 3181.8 | 3151.8 | 3213.9 | 3074.0 |
| 45°   | 4093.9 | 4089.3 | 4104.6 | 4017.1 | 3924.0 | 3839.1 | 3668.7 | 3607.6 | 3594.4 | 3667.1 | 3499.8 |
| 47.5° | 4402.7 | 4413.9 | 4461.2 | 4424.1 | 4386.4 | 4311.6 | 4125.0 | 4097.5 | 4105.6 | 4193.6 | 3948.9 |
| 50°   | 4660.1 | 4673.3 | 4803.0 | 4845.8 | 4900.2 | 4856.4 | 4669.3 | 4652.5 | 4684.5 | 4763.9 | 4432.2 |
| 52.5° | 4846.3 | 4873.2 | 5034.5 | 5231.4 | 5429.7 | 5459.2 | 5272.6 | 5257.3 | 5300.5 | 5312.7 | 4805.6 |
| 55°   | 4975.5 | 4999.4 | 5182.0 | 5542.2 | 5946.1 | 6073.2 | 5957.3 | 5898.2 | 5890.1 | 5769.5 | 5198.3 |
| 57.5° | 4998.4 | 4995.8 | 5258.3 | 5743.1 | 6351.0 | 6679.1 | 6605.8 | 6547.8 | 6381.0 | 6191.8 | 5648.5 |
| 60°   | 4869.2 | 4883.9 | 5188.6 | 5812.8 | 6605.3 | 7137.4 | 7143.0 | 7067.7 | 6807.8 | 6602.3 | 6084.9 |
| 62.5° | 4471.4 | 4531.4 | 4839.2 | 5630.2 | 6602.3 | 7322.1 | 7536.7 | 7479.2 | 7168.4 | 6938.5 | 6527.5 |
| 65°   | 3826.4 | 3847.7 | 4141.2 | 5004.5 | 6156.1 | 7244.7 | 7891.3 | 7869.9 | 7493.5 | 7265.1 | 6754.9 |
| 67.5° | 2794.2 | 2747.9 | 3056.2 | 3940.8 | 5212.0 | 6794.0 | 8145.6 | 8172.6 | 7744.3 | 7332.2 | 6512.7 |
| 68°   | 2550.1 | 2563.8 | 2803.9 | 3677.8 | 4964.8 | 6634.8 | 8162.4 | 8203.6 | 7769.2 | 7288.5 | 6380.5 |
| 70°   | 1520.0 | 1546.4 | 1760.6 | 2532.3 | 3777.0 | 5733.9 | 7981.3 | 8075.4 | 7620.7 | 6837.3 | 5518.8 |
| 72.5° | 388.1  | 419.7  | 622.1  | 1133.4 | 2157.3 | 4040.0 | 6737.6 | 6896.8 | 6616.5 | 5546.7 | 3725.6 |
| 75°   | 159.7  | 167.9  | 222.3  | 373.4  | 803.7  | 1820.1 | 4440.9 | 4781.7 | 4586.8 | 3320.7 | 1683.8 |
| 77.5° | 110.4  | 116.0  | 142.9  | 207.0  | 347.9  | 617.0  | 2177.2 | 2423.4 | 2183.3 | 1133.4 | 367.3  |
| 80°   | 79.4   | 83.9   | 102.2  | 137.9  | 199.9  | 220.3  | 709.6  | 820.5  | 651.6  | 248.7  | 91.1   |
| 82.5° | 47.3   | 50.9   | 76.3   | 98.2   | 121.6  | 105.3  | 176.5  | 200.4  | 188.7  | 123.6  | 40.7   |
| 85°   | 23.4   | 27.5   | 51.4   | 70.2   | 65.6   | 44.3   | 53.9   | 60.0   | 74.3   | 75.3   | 21.9   |
| 87.5° | 1.5    | 3.1    | 30.0   | 42.2   | 18.3   | 10.2   | 15.8   | 19.3   | 26.5   | 37.1   | 9.2    |
| 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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CATALOG NUMBER: GWC-SA2C-740-U-T3-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1278.3 | 1278.3 | 1278.3 | 1278.3 | 1278.3 | 1278.3 | 1278.3 | 1278.3 | 1278.3 | 1278.3 | 1278.3 |
| 2.5°  | 1281.9 | 1282.4 | 1278.8 | 1277.3 | 1278.3 | 1272.2 | 1269.7 | 1270.7 | 1270.7 | 1272.2 | 1269.7 |
| 5°    | 1294.6 | 1294.6 | 1288.5 | 1280.4 | 1275.8 | 1264.1 | 1256.5 | 1254.4 | 1252.9 | 1251.9 | 1249.8 |
| 7.5°  | 1322.1 | 1319.0 | 1308.3 | 1290.5 | 1275.3 | 1249.8 | 1230.5 | 1220.3 | 1215.3 | 1213.2 | 1211.7 |
| 10°   | 1366.3 | 1360.7 | 1342.9 | 1309.9 | 1274.8 | 1229.5 | 1187.3 | 1157.3 | 1132.3 | 1122.2 | 1116.1 |
| 12.5° | 1425.9 | 1417.7 | 1387.7 | 1332.8 | 1271.2 | 1187.8 | 1096.2 | 1008.2 | 926.3  | 892.7  | 876.0  |
| 15°   | 1494.5 | 1482.8 | 1435.5 | 1352.1 | 1250.4 | 1093.7 | 894.8  | 740.7  | 627.2  | 584.5  | 566.2  |
| 17.5° | 1564.2 | 1549.0 | 1477.2 | 1364.3 | 1187.8 | 898.9  | 627.7  | 474.1  | 398.3  | 378.0  | 370.8  |
| 20°   | 1634.4 | 1612.0 | 1513.3 | 1355.1 | 1046.4 | 648.1  | 414.1  | 346.4  | 324.5  | 318.4  | 316.4  |
| 22.5° | 1701.1 | 1666.5 | 1545.9 | 1319.5 | 828.7  | 434.9  | 327.6  | 306.2  | 299.1  | 295.5  | 294.5  |
| 25°   | 1759.0 | 1710.7 | 1574.4 | 1209.7 | 586.5  | 328.6  | 295.0  | 287.9  | 278.8  | 272.1  | 272.7  |
| 27.5° | 1813.5 | 1755.0 | 1591.7 | 1028.6 | 391.2  | 280.8  | 273.2  | 263.5  | 246.7  | 237.0  | 237.0  |
| 30°   | 1879.1 | 1814.0 | 1604.4 | 791.5  | 287.9  | 248.2  | 242.1  | 227.4  | 204.5  | 191.8  | 191.8  |
| 32.5° | 1977.8 | 1903.5 | 1596.3 | 555.5  | 238.6  | 218.2  | 204.0  | 183.6  | 158.7  | 146.5  | 146.0  |
| 35°   | 2128.9 | 2041.9 | 1538.3 | 364.2  | 210.6  | 189.7  | 166.8  | 141.9  | 120.1  | 109.9  | 109.4  |
| 37.5° | 2332.3 | 2227.0 | 1408.0 | 260.4  | 188.7  | 163.3  | 135.8  | 108.4  | 92.1   | 85.5   | 85.0   |
| 40°   | 2596.3 | 2442.2 | 1221.9 | 211.1  | 168.4  | 137.9  | 104.8  | 83.9   | 72.7   | 67.7   | 68.2   |
| 42.5° | 2913.3 | 2672.6 | 998.6  | 182.1  | 148.5  | 113.4  | 81.9   | 66.1   | 59.0   | 55.4   | 54.4   |
| 45°   | 3265.3 | 2900.0 | 764.6  | 162.3  | 128.7  | 91.6   | 64.1   | 52.4   | 46.8   | 44.8   | 44.8   |
| 47.5° | 3652.4 | 3121.3 | 559.6  | 145.0  | 107.3  | 70.7   | 51.4   | 42.7   | 38.2   | 36.6   | 36.1   |
| 50°   | 4003.9 | 3274.9 | 403.4  | 126.7  | 88.0   | 56.0   | 41.7   | 35.6   | 32.6   | 30.5   | 30.5   |
| 52.5° | 4296.9 | 3323.3 | 297.1  | 106.8  | 71.2   | 44.8   | 34.6   | 30.5   | 27.5   | 25.9   | 25.9   |
| 55°   | 4554.8 | 3303.4 | 220.8  | 88.0   | 57.5   | 36.6   | 29.5   | 25.9   | 23.4   | 21.9   | 21.9   |
| 57.5° | 4802.0 | 3239.3 | 164.8  | 71.7   | 46.3   | 29.5   | 24.9   | 21.9   | 19.3   | 18.3   | 18.3   |
| 60°   | 5004.0 | 3132.5 | 122.6  | 58.0   | 37.1   | 23.9   | 20.9   | 17.8   | 15.8   | 14.2   | 14.2   |
| 62.5° | 5167.8 | 3014.5 | 90.0   | 47.8   | 29.5   | 18.8   | 16.3   | 14.8   | 11.7   | 10.2   | 10.2   |
| 65°   | 5168.8 | 2818.6 | 67.7   | 39.7   | 22.9   | 14.8   | 12.2   | 11.7   | 7.6    | 6.1    | 5.6    |
| 67.5° | 4794.9 | 2430.0 | 51.9   | 34.1   | 17.8   | 11.2   | 9.2    | 9.7    | 4.1    | 2.5    | 2.0    |
| 68°   | 4659.1 | 2331.3 | 48.8   | 33.6   | 16.8   | 10.7   | 8.6    | 9.7    | 3.6    | 2.0    | 1.5    |
| 70°   | 3928.1 | 1854.7 | 39.2   | 32.6   | 14.8   | 8.1    | 7.1    | 9.7    | 3.1    | 1.5    | 1.0    |
| 72.5° | 2512.4 | 1076.4 | 29.0   | 25.9   | 11.2   | 6.1    | 4.6    | 8.6    | 3.1    | 1.0    | 0.5    |
| 75°   | 1069.3 | 333.7  | 19.8   | 18.3   | 6.6    | 4.6    | 3.1    | 5.6    | 2.0    | 0.5    | 0.0    |
| 77.5° | 225.3  | 75.3   | 11.7   | 11.2   | 4.6    | 3.1    | 2.0    | 1.5    | 0.5    | 0.0    | 0.0    |
| 80°   | 58.0   | 21.9   | 6.1    | 5.6    | 2.5    | 1.5    | 1.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 82.5° | 18.3   | 8.6    | 3.6    | 2.5    | 1.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 85°   | 9.2    | 5.1    | 2.0    | 1.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 87.5° | 5.1    | 1.5    | 0.5    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

Report Prepared for

Cooper Lighting Solutions

(formerly Eaton)

INVUE

Report Number: SP1-2104-224-3

Luminaire Tested: CCW-SA-2A-740-U-SL4

Test Date: 04/26/2021

### Test Information

Test Method: LM-79-08  
 Report Number: SP1-2104-224-3  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1  
 Measurement Geometry:  $4\pi$   
 Issue Date: 04/26/2021  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: INVUE  
 Catalog Number: **CCW-SA-2A-740-U-SL4**  
 Description: INVUE WALL PACK ClearCurve Light Square

### Spectral Parameters

|                           |        |           |      |      |       |
|---------------------------|--------|-----------|------|------|-------|
| CCT (K):                  | 3829   | CRI (Ra): | 69.8 |      |       |
| CIE u':                   | 0.2271 | R1:       | 67.2 | R9:  | -35.1 |
| CIE v':                   | 0.5076 | R2:       | 75.2 | R10: | 43.1  |
| Duv:                      | 0.0022 | R3:       | 83.2 | R11: | 69.0  |
| CIE x:                    | 0.3900 | R4:       | 71.0 | R12: | 44.3  |
| CIE y:                    | 0.3873 | R5:       | 67.4 | R13: | 67.6  |
| CIE z:                    | 0.2227 | R6:       | 66.8 | R14: | 90.3  |
| Peak Wavelength (nm):     | 440    | R7:       | 77.6 |      |       |
| Dominant Wavelength (nm): | 578    | R8:       | 50.3 |      |       |
| Purity:                   | 33.4   |           |      |      |       |
| Rf:                       | 70.6   |           |      |      |       |
| Rg:                       | 96.7   |           |      |      |       |



### Test Conditions

Stabilization Time: 62M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 24.8/39%  
 Sphere Temperature (°C): 24.2

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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 7-step quadrangle

REPORT NUMBER: SP1-2104-224-3

### Photopic Flux vs. Wavelength

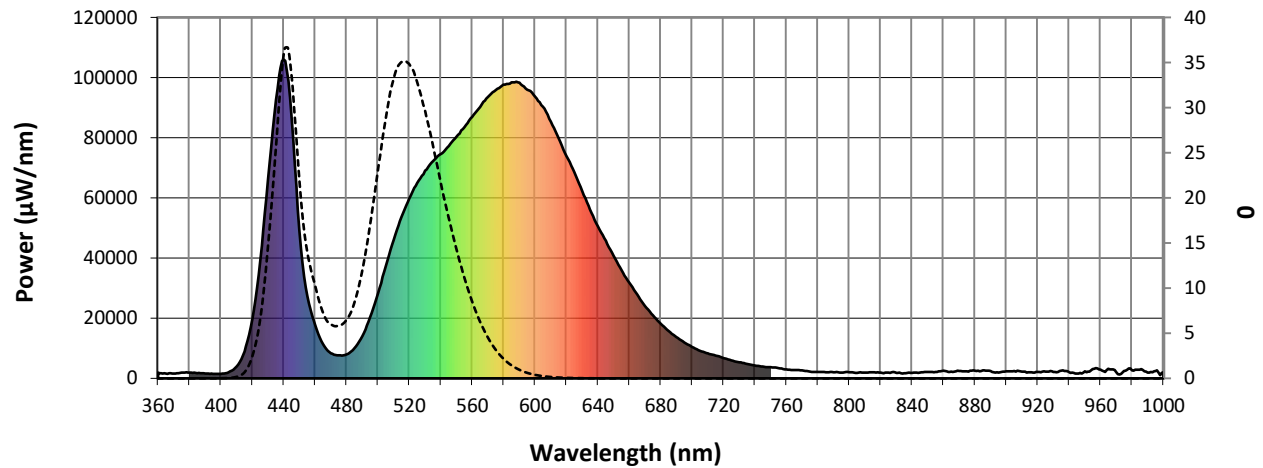


#####

| 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       | 1901             | 0.0              | 490       | 14057            | 2.0              | 620       | 73853            | 19.2             | 750       | 3678             | 0.0              | 880       | 2528             | 0.0              |
| 365       | 1585             | 0.0              | 495       | 20304            | 3.7              | 625       | 68653            | 15.1             | 755       | 3385             | 0.0              | 885       | 2638             | 0.0              |
| 370       | 1604             | 0.0              | 500       | 28346            | 6.3              | 630       | 62254            | 11.3             | 760       | 2963             | 0.0              | 890       | 2417             | 0.0              |
| 375       | 1905             | 0.0              | 505       | 37228            | 10.4             | 635       | 56177            | 8.4              | 765       | 2782             | 0.0              | 895       | 1902             | 0.0              |
| 380       | 1882             | 0.0              | 510       | 46037            | 15.8             | 640       | 50521            | 6.0              | 770       | 2657             | 0.0              | 900       | 2330             | 0.0              |
| 385       | 1693             | 0.0              | 515       | 53619            | 22.2             | 645       | 45727            | 4.4              | 775       | 2259             | 0.0              | 905       | 2456             | 0.0              |
| 390       | 1640             | 0.0              | 520       | 59890            | 29.0             | 650       | 40814            | 3.0              | 780       | 2169             | 0.0              | 910       | 2205             | 0.0              |
| 395       | 1513             | 0.0              | 525       | 64946            | 34.9             | 655       | 35925            | 2.1              | 785       | 2065             | 0.0              | 915       | 2002             | 0.0              |
| 400       | 1481             | 0.0              | 530       | 69048            | 40.7             | 660       | 31824            | 1.3              | 790       | 2054             | 0.0              | 920       | 2125             | 0.0              |
| 405       | 2044             | 0.0              | 535       | 72246            | 44.8             | 665       | 27860            | 0.9              | 795       | 1908             | 0.0              | 925       | 2266             | 0.0              |
| 410       | 3966             | 0.0              | 540       | 74621            | 48.6             | 670       | 24069            | 0.5              | 800       | 2026             | 0.0              | 930       | 2159             | 0.0              |
| 415       | 8943             | 0.0              | 545       | 77288            | 51.4             | 675       | 20926            | 0.4              | 805       | 1766             | 0.0              | 935       | 2581             | 0.0              |
| 420       | 19566            | 0.1              | 550       | 80334            | 54.6             | 680       | 18170            | 0.2              | 810       | 1913             | 0.0              | 940       | 2052             | 0.0              |
| 425       | 39243            | 0.2              | 555       | 83561            | 57.1             | 685       | 15785            | 0.1              | 815       | 2019             | 0.0              | 945       | 1631             | 0.0              |
| 430       | 66113            | 0.5              | 560       | 86964            | 59.1             | 690       | 13770            | 0.1              | 820       | 1876             | 0.0              | 950       | 2301             | 0.0              |
| 435       | 92550            | 1.1              | 565       | 90264            | 60.0             | 695       | 11953            | 0.1              | 825       | 1869             | 0.0              | 955       | 3077             | 0.0              |
| 440       | 106034           | 1.7              | 570       | 93519            | 60.8             | 700       | 10452            | 0.0              | 830       | 1862             | 0.0              | 960       | 2911             | 0.0              |
| 445       | 86383            | 1.8              | 575       | 95920            | 59.7             | 705       | 9162             | 0.0              | 835       | 1663             | 0.0              | 965       | 3163             | 0.0              |
| 450       | 49216            | 1.3              | 580       | 97650            | 58.0             | 710       | 8266             | 0.0              | 840       | 1843             | 0.0              | 970       | 1995             | 0.0              |
| 455       | 27376            | 0.9              | 585       | 98486            | 54.7             | 715       | 7583             | 0.0              | 845       | 1921             | 0.0              | 975       | 2418             | 0.0              |
| 460       | 17830            | 0.7              | 590       | 98332            | 50.8             | 720       | 6750             | 0.0              | 850       | 2105             | 0.0              | 980       | 2674             | 0.0              |
| 465       | 11374            | 0.6              | 595       | 96023            | 45.5             | 725       | 5965             | 0.0              | 855       | 2096             | 0.0              | 985       | 2850             | 0.0              |
| 470       | 8344             | 0.5              | 600       | 93650            | 40.4             | 730       | 5310             | 0.0              | 860       | 2601             | 0.0              | 990       | 1972             | 0.0              |
| 475       | 7639             | 0.6              | 605       | 90313            | 35.0             | 735       | 4838             | 0.0              | 865       | 2199             | 0.0              | 995       | 2443             | 0.0              |
| 480       | 7991             | 0.8              | 610       | 85305            | 29.3             | 740       | 4280             | 0.0              | 870       | 2491             | 0.0              | 1000      | 1979             | 0.0              |
| 485       | 9994             | 1.2              | 615       | 79870            | 24.1             | 745       | 3928             | 0.0              | 875       | 2370             | 0.0              |           |                  |                  |

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### Scotopic Flux vs. Wavelength



Scotopic Lumens: 7682.8

S/P: 1.42

| 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       | 1901             | 0.0              | 490       | 14057            | 21.6             | 620       | 73853            | 0.9              | 750       | 3678             | 0.0              | 880       | 2528             | 0.0              |
| 365       | 1585             | 0.0              | 495       | 20304            | 32.8             | 625       | 68653            | 0.6              | 755       | 3385             | 0.0              | 885       | 2638             | 0.0              |
| 370       | 1604             | 0.0              | 500       | 28346            | 47.4             | 630       | 62254            | 0.4              | 760       | 2963             | 0.0              | 890       | 2417             | 0.0              |
| 375       | 1905             | 0.0              | 505       | 37228            | 63.3             | 635       | 56177            | 0.2              | 765       | 2782             | 0.0              | 895       | 1902             | 0.0              |
| 380       | 1882             | 0.0              | 510       | 46037            | 78.0             | 640       | 50521            | 0.1              | 770       | 2657             | 0.0              | 900       | 2330             | 0.0              |
| 385       | 1693             | 0.0              | 515       | 53619            | 88.9             | 645       | 45727            | 0.1              | 775       | 2259             | 0.0              | 905       | 2456             | 0.0              |
| 390       | 1640             | 0.0              | 520       | 59890            | 95.2             | 650       | 40814            | 0.0              | 780       | 2169             | 0.0              | 910       | 2205             | 0.0              |
| 395       | 1513             | 0.0              | 525       | 64946            | 97.2             | 655       | 35925            | 0.0              | 785       | 2065             | 0.0              | 915       | 2002             | 0.0              |
| 400       | 1481             | 0.0              | 530       | 69048            | 95.2             | 660       | 31824            | 0.0              | 790       | 2054             | 0.0              | 920       | 2125             | 0.0              |
| 405       | 2044             | 0.1              | 535       | 72246            | 90.0             | 665       | 27860            | 0.0              | 795       | 1908             | 0.0              | 925       | 2266             | 0.0              |
| 410       | 3966             | 0.2              | 540       | 74621            | 82.5             | 670       | 24069            | 0.0              | 800       | 2026             | 0.0              | 930       | 2159             | 0.0              |
| 415       | 8943             | 0.9              | 545       | 77288            | 74.1             | 675       | 20926            | 0.0              | 805       | 1766             | 0.0              | 935       | 2581             | 0.0              |
| 420       | 19566            | 3.2              | 550       | 80334            | 65.7             | 680       | 18170            | 0.0              | 810       | 1913             | 0.0              | 940       | 2052             | 0.0              |
| 425       | 39243            | 9.6              | 555       | 83561            | 57.1             | 685       | 15785            | 0.0              | 815       | 2019             | 0.0              | 945       | 1631             | 0.0              |
| 430       | 66113            | 22.5             | 560       | 86964            | 48.6             | 690       | 13770            | 0.0              | 820       | 1876             | 0.0              | 950       | 2301             | 0.0              |
| 435       | 92550            | 41.4             | 565       | 90264            | 40.5             | 695       | 11953            | 0.0              | 825       | 1869             | 0.0              | 955       | 3077             | 0.0              |
| 440       | 106034           | 59.3             | 570       | 93519            | 33.0             | 700       | 10452            | 0.0              | 830       | 1862             | 0.0              | 960       | 2911             | 0.0              |
| 445       | 86383            | 57.8             | 575       | 95920            | 26.1             | 705       | 9162             | 0.0              | 835       | 1663             | 0.0              | 965       | 3163             | 0.0              |
| 450       | 49216            | 38.1             | 580       | 97650            | 20.1             | 710       | 8266             | 0.0              | 840       | 1843             | 0.0              | 970       | 1995             | 0.0              |
| 455       | 27376            | 23.9             | 585       | 98486            | 15.1             | 715       | 7583             | 0.0              | 845       | 1921             | 0.0              | 975       | 2418             | 0.0              |
| 460       | 17830            | 17.2             | 590       | 98332            | 10.9             | 720       | 6750             | 0.0              | 850       | 2105             | 0.0              | 980       | 2674             | 0.0              |
| 465       | 11374            | 12.0             | 595       | 96023            | 7.7              | 725       | 5965             | 0.0              | 855       | 2096             | 0.0              | 985       | 2850             | 0.0              |
| 470       | 8344             | 9.6              | 600       | 93650            | 5.3              | 730       | 5310             | 0.0              | 860       | 2601             | 0.0              | 990       | 1972             | 0.0              |
| 475       | 7639             | 9.6              | 605       | 90313            | 3.5              | 735       | 4838             | 0.0              | 865       | 2199             | 0.0              | 995       | 2443             | 0.0              |
| 480       | 7991             | 10.8             | 610       | 85305            | 2.3              | 740       | 4280             | 0.0              | 870       | 2491             | 0.0              | 1000      | 1979             | 0.0              |
| 485       | 9994             | 14.5             | 615       | 79870            | 1.5              | 745       | 3928             | 0.0              | 875       | 2370             | 0.0              |           |                  |                  |

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### Melanopic Flux vs. Wavelength



**Melanopic Lumens: 2823**

**M/P: 0.52**

| 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       | 1901             | 0.0              | 490       | 14057            | 11.7             | 620       | 73853            | 0.1              | 750       | 3678             | 0.0              | 880       | 2528             | 0.0              |
| 365       | 1585             | 0.0              | 495       | 20304            | 16.8             | 625       | 68653            | 0.0              | 755       | 3385             | 0.0              | 885       | 2638             | 0.0              |
| 370       | 1604             | 0.0              | 500       | 28346            | 22.8             | 630       | 62254            | 0.0              | 760       | 2963             | 0.0              | 890       | 2417             | 0.0              |
| 375       | 1905             | 0.0              | 505       | 37228            | 28.6             | 635       | 56177            | 0.0              | 765       | 2782             | 0.0              | 895       | 1902             | 0.0              |
| 380       | 1882             | 0.0              | 510       | 46037            | 33.1             | 640       | 50521            | 0.0              | 770       | 2657             | 0.0              | 900       | 2330             | 0.0              |
| 385       | 1693             | 0.0              | 515       | 53619            | 35.0             | 645       | 45727            | 0.0              | 775       | 2259             | 0.0              | 905       | 2456             | 0.0              |
| 390       | 1640             | 0.0              | 520       | 59890            | 34.9             | 650       | 40814            | 0.0              | 780       | 2169             | 0.0              | 910       | 2205             | 0.0              |
| 395       | 1513             | 0.0              | 525       | 64946            | 32.9             | 655       | 35925            | 0.0              | 785       | 2065             | 0.0              | 915       | 2002             | 0.0              |
| 400       | 1481             | 0.0              | 530       | 69048            | 29.8             | 660       | 31824            | 0.0              | 790       | 2054             | 0.0              | 920       | 2125             | 0.0              |
| 405       | 2044             | 0.0              | 535       | 72246            | 26.0             | 665       | 27860            | 0.0              | 795       | 1908             | 0.0              | 925       | 2266             | 0.0              |
| 410       | 3966             | 0.2              | 540       | 74621            | 21.8             | 670       | 24069            | 0.0              | 800       | 2026             | 0.0              | 930       | 2159             | 0.0              |
| 415       | 8943             | 0.6              | 545       | 77288            | 18.0             | 675       | 20926            | 0.0              | 805       | 1766             | 0.0              | 935       | 2581             | 0.0              |
| 420       | 19566            | 2.2              | 550       | 80334            | 14.4             | 680       | 18170            | 0.0              | 810       | 1913             | 0.0              | 940       | 2052             | 0.0              |
| 425       | 39243            | 6.1              | 555       | 83561            | 11.3             | 685       | 15785            | 0.0              | 815       | 2019             | 0.0              | 945       | 1631             | 0.0              |
| 430       | 66113            | 14.0             | 560       | 86964            | 8.6              | 690       | 13770            | 0.0              | 820       | 1876             | 0.0              | 950       | 2301             | 0.0              |
| 435       | 92550            | 24.7             | 565       | 90264            | 6.3              | 695       | 11953            | 0.0              | 825       | 1869             | 0.0              | 955       | 3077             | 0.0              |
| 440       | 106034           | 35.4             | 570       | 93519            | 4.6              | 700       | 10452            | 0.0              | 830       | 1862             | 0.0              | 960       | 2911             | 0.0              |
| 445       | 86383            | 34.1             | 575       | 95920            | 3.2              | 705       | 9162             | 0.0              | 835       | 1663             | 0.0              | 965       | 3163             | 0.0              |
| 450       | 49216            | 22.7             | 580       | 97650            | 2.2              | 710       | 8266             | 0.0              | 840       | 1843             | 0.0              | 970       | 1995             | 0.0              |
| 455       | 27376            | 14.3             | 585       | 98486            | 1.5              | 715       | 7583             | 0.0              | 845       | 1921             | 0.0              | 975       | 2418             | 0.0              |
| 460       | 17830            | 10.5             | 590       | 98332            | 1.0              | 720       | 6750             | 0.0              | 850       | 2105             | 0.0              | 980       | 2674             | 0.0              |
| 465       | 11374            | 7.4              | 595       | 96023            | 0.6              | 725       | 5965             | 0.0              | 855       | 2096             | 0.0              | 985       | 2850             | 0.0              |
| 470       | 8344             | 6.0              | 600       | 93650            | 0.4              | 730       | 5310             | 0.0              | 860       | 2601             | 0.0              | 990       | 1972             | 0.0              |
| 475       | 7639             | 5.8              | 605       | 90313            | 0.2              | 735       | 4838             | 0.0              | 865       | 2199             | 0.0              | 995       | 2443             | 0.0              |
| 480       | 7991             | 6.4              | 610       | 85305            | 0.2              | 740       | 4280             | 0.0              | 870       | 2491             | 0.0              | 1000      | 1979             | 0.0              |
| 485       | 9994             | 8.2              | 615       | 79870            | 0.1              | 745       | 3928             | 0.0              | 875       | 2370             | 0.0              |           |                  |                  |

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TM-30-18

### Summary

$R_f = 70.6$   
 $R_g = 96.7$   
 CIE  $R_a = 69.8$   
 $R_g = -35.1$

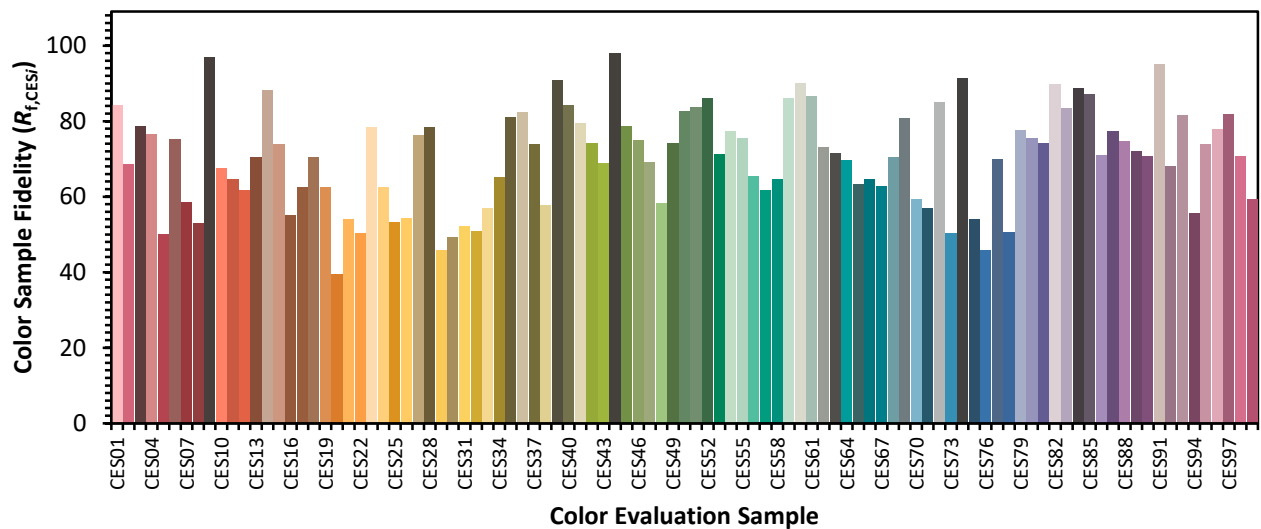


### Color Vector Graphics



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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 54 | CES51 = 84 | CES76 = 46 |
| CES02 = 61 | CES27 = 76 | CES52 = 86 | CES77 = 70 |
| CES03 = 30 | CES28 = 78 | CES53 = 71 | CES78 = 50 |
| CES04 = 70 | CES29 = 46 | CES54 = 77 | CES79 = 77 |
| CES05 = 47 | CES30 = 49 | CES55 = 76 | CES80 = 75 |
| CES06 = 50 | CES31 = 52 | CES56 = 65 | CES81 = 74 |
| CES07 = 40 | CES32 = 51 | CES57 = 62 | CES82 = 90 |
| CES08 = 39 | CES33 = 57 | CES58 = 65 | CES83 = 84 |
| CES09 = 29 | CES34 = 65 | CES59 = 86 | CES84 = 89 |
| CES10 = 74 | CES35 = 81 | CES60 = 90 | CES85 = 87 |
| CES11 = 57 | CES36 = 82 | CES61 = 87 | CES86 = 71 |
| CES12 = 63 | CES37 = 74 | CES62 = 73 | CES87 = 77 |
| CES13 = 42 | CES38 = 58 | CES63 = 72 | CES88 = 75 |
| CES14 = 74 | CES39 = 91 | CES64 = 70 | CES89 = 72 |
| CES15 = 71 | CES40 = 84 | CES65 = 63 | CES90 = 71 |
| CES16 = 46 | CES41 = 79 | CES66 = 65 | CES91 = 95 |
| CES17 = 49 | CES42 = 74 | CES67 = 63 | CES92 = 68 |
| CES18 = 56 | CES43 = 69 | CES68 = 70 | CES93 = 82 |
| CES19 = 72 | CES44 = 98 | CES69 = 81 | CES94 = 56 |
| CES20 = 65 | CES45 = 79 | CES70 = 59 | CES95 = 74 |
| CES21 = 86 | CES46 = 75 | CES71 = 57 | CES96 = 78 |
| CES22 = 78 | CES47 = 69 | CES72 = 85 | CES97 = 82 |
| CES23 = 92 | CES48 = 58 | CES73 = 50 | CES98 = 71 |
| CES24 = 91 | CES49 = 74 | CES74 = 91 | CES99 = 59 |
| CES25 = 72 | CES50 = 83 | CES75 = 54 |            |



Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)