

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: P385527

Luminaire Tested: **GWC-SA1A-750-U-T2**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P385527  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-12)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GWC-SA1A-750-U-T2  
Description: GALLEON WALL LUMINAIRE  
(1) 70 CRI, 5000K, 615mA LIGHTSQUARE WITH 16 LEDS AND TYPE II OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 4884 lumens  
Efficiency: N/A  
Efficacy: 143.6 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 0.5' x H: 0')  
IES Classification: Type III - Medium  
BUG Rating: B1 - U0 - G1

Input Watts (W): 34  
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

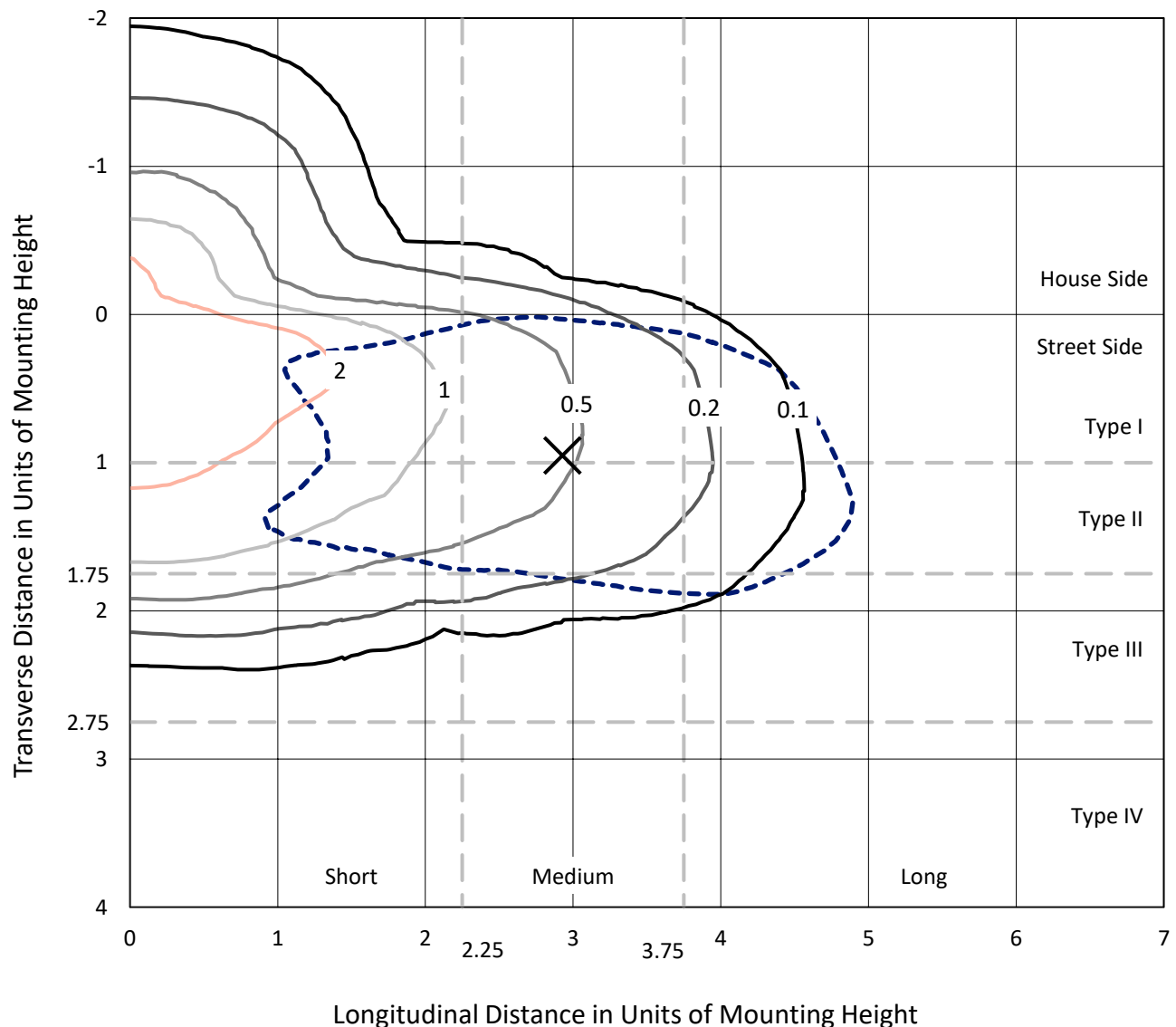


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## Iso-Footcandle Lines of Horizontal Illumination

× Max cd  
 - - - 1/2 Max cd

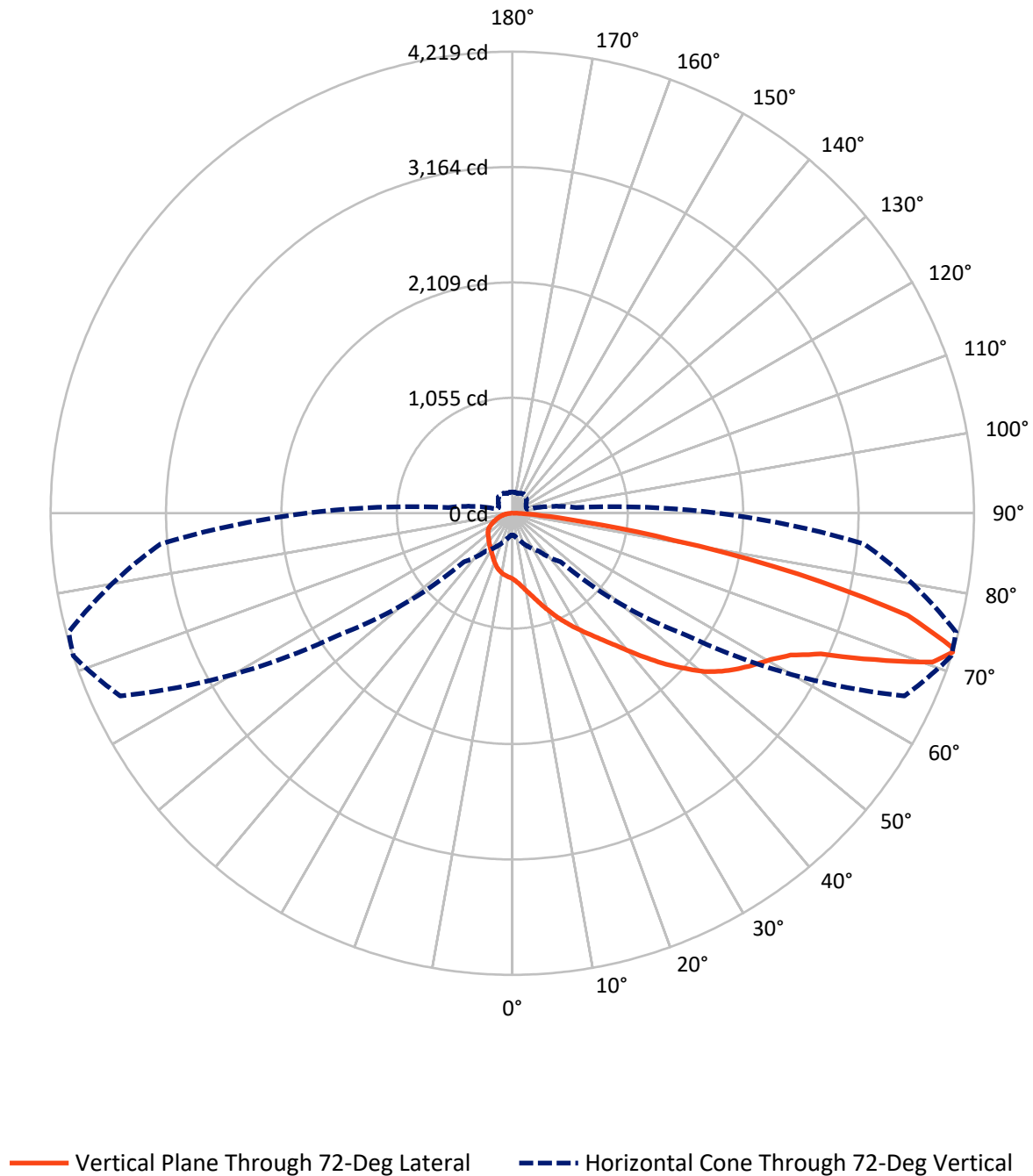


Based on 15 foot mounting height. Maximum calculated value = 3.7 fc  
 Type III - Medium - N/A

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## Luminous Intensity Polar Plot



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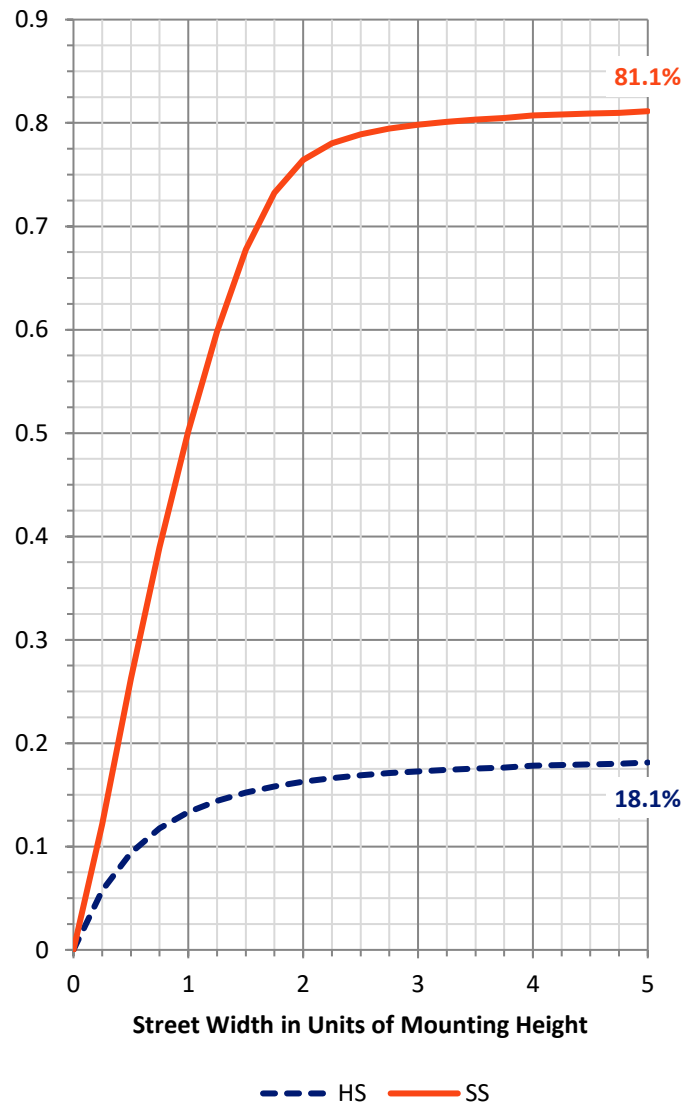
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 906.0    | 0.0    | 906.0  |
|                    | % Fixture | 18.6     | 0.0    | 18.6   |
| <b>Street Side</b> | Lumens    | 3978.0   | 0.0    | 3978.0 |
|                    | % Fixture | 81.4     | 0.0    | 81.4   |
| <b>Total</b>       | Lumens    | 4884.0   | 0.0    | 4884.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 60.2   | 1.2       |
| 10°-20°   | 194.6  | 4.0       |
| 20°-30°   | 340.9  | 7.0       |
| 30°-40°   | 505.5  | 10.4      |
| 40°-50°   | 739.3  | 15.1      |
| 50°-60°   | 1017.3 | 20.8      |
| 60°-70°   | 1132.6 | 23.2      |
| 70°-80°   | 767.4  | 15.7      |
| 80°-90°   | 126.1  | 2.6       |
| 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°    | 4884.0 | 100.0     |
| 0°-180°   | 4884.0 | 100.0     |

**Coefficient of Utilization**



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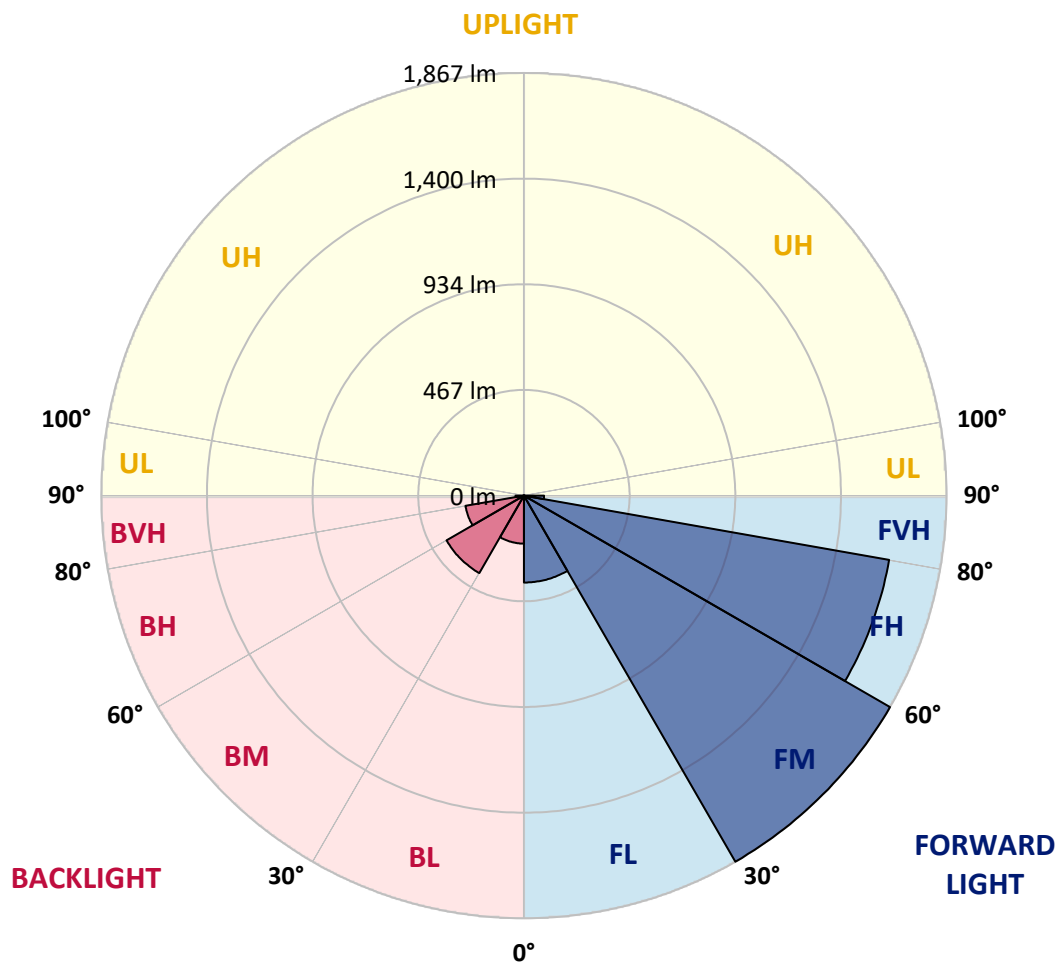
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**LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:**

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 383.9  | 7.9       |                         |      |         |
| FM   | (30°-60°)   | 1867.2 | 38.2      |                         |      |         |
| FH   | (60°-80°)   | 1637.9 | 33.5      |                         |      | G1/1800 |
| FVH  | (80°-90°)   | 89.0   | 1.8       |                         |      | G1/100  |
| BL   | (0°-30°)    | 211.8  | 4.3       | B1/500                  |      |         |
| BM   | (30°-60°)   | 394.9  | 8.1       | B1/1000                 |      |         |
| BH   | (60°-80°)   | 262.1  | 5.4       | B1/500                  |      | G1/500  |
| BVH  | (80°-90°)   | 37.2   | 0.8       |                         |      | G1/100  |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B1-U0-G1**

Type III Medium



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 65°    | 72°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 600.9  | 600.9  | 600.9  | 600.9  | 600.9  | 600.9  | 600.9  | 600.9  | 600.9  | 600.9  | 600.9  |
| 2.5°  | 663.8  | 662.7  | 659.2  | 659.2  | 652.5  | 646.8  | 636.0  | 628.8  | 620.2  | 617.2  | 607.1  |
| 5°    | 728.0  | 728.3  | 724.0  | 720.9  | 711.0  | 698.9  | 680.6  | 663.9  | 647.3  | 640.5  | 619.9  |
| 7.5°  | 782.0  | 781.3  | 780.1  | 777.6  | 768.4  | 755.9  | 731.2  | 706.5  | 681.9  | 671.8  | 636.2  |
| 10°   | 816.6  | 818.1  | 819.1  | 820.3  | 816.4  | 807.5  | 784.2  | 754.1  | 721.9  | 708.1  | 655.7  |
| 12.5° | 834.1  | 836.8  | 841.5  | 849.6  | 856.0  | 855.0  | 838.0  | 806.0  | 767.8  | 750.5  | 680.1  |
| 15°   | 844.4  | 847.9  | 855.3  | 869.8  | 887.8  | 898.0  | 893.5  | 864.5  | 822.0  | 800.6  | 709.8  |
| 17.5° | 850.8  | 853.6  | 865.0  | 884.4  | 911.1  | 938.4  | 950.3  | 926.1  | 883.2  | 858.8  | 744.0  |
| 20°   | 855.1  | 857.3  | 871.6  | 894.3  | 929.0  | 972.3  | 1005.6 | 999.6  | 950.6  | 919.0  | 779.6  |
| 22.5° | 864.9  | 866.7  | 880.4  | 903.2  | 941.6  | 997.6  | 1058.9 | 1068.0 | 1021.8 | 986.0  | 817.8  |
| 25°   | 892.1  | 892.1  | 903.6  | 919.5  | 955.5  | 1019.4 | 1104.0 | 1144.2 | 1094.4 | 1052.7 | 853.1  |
| 27.5° | 944.1  | 943.6  | 947.8  | 953.3  | 980.6  | 1041.6 | 1144.2 | 1211.5 | 1169.8 | 1124.2 | 887.4  |
| 30°   | 1005.6 | 1009.0 | 1009.5 | 1006.8 | 1019.6 | 1069.4 | 1181.4 | 1282.4 | 1245.6 | 1196.5 | 922.6  |
| 32.5° | 1084.8 | 1087.0 | 1084.5 | 1075.6 | 1073.7 | 1108.7 | 1217.9 | 1356.8 | 1327.7 | 1272.0 | 954.7  |
| 35°   | 1185.4 | 1181.2 | 1173.3 | 1155.1 | 1137.8 | 1161.4 | 1259.6 | 1431.1 | 1419.8 | 1363.3 | 998.9  |
| 37.5° | 1293.2 | 1293.4 | 1283.6 | 1242.4 | 1218.5 | 1228.6 | 1317.1 | 1515.3 | 1531.3 | 1472.0 | 1055.6 |
| 40°   | 1379.6 | 1384.2 | 1390.2 | 1336.1 | 1305.1 | 1319.1 | 1390.2 | 1613.1 | 1663.2 | 1600.8 | 1129.4 |
| 42.5° | 1440.0 | 1445.2 | 1462.4 | 1428.4 | 1396.3 | 1422.2 | 1476.3 | 1717.3 | 1811.2 | 1749.4 | 1215.8 |
| 45°   | 1503.9 | 1506.8 | 1518.9 | 1504.3 | 1483.7 | 1542.1 | 1573.4 | 1825.3 | 1967.7 | 1907.9 | 1312.5 |
| 47.5° | 1571.2 | 1574.2 | 1586.7 | 1576.9 | 1566.1 | 1654.1 | 1674.6 | 1927.0 | 2117.7 | 2081.9 | 1415.8 |
| 50°   | 1654.3 | 1656.3 | 1668.0 | 1650.4 | 1653.8 | 1738.5 | 1765.1 | 2020.4 | 2275.0 | 2238.3 | 1519.4 |
| 52.5° | 1767.6 | 1768.1 | 1784.4 | 1768.4 | 1752.6 | 1800.4 | 1842.9 | 2108.3 | 2398.2 | 2380.9 | 1623.0 |
| 55°   | 1856.4 | 1861.8 | 1915.2 | 1911.9 | 1902.8 | 1856.6 | 1908.0 | 2192.1 | 2508.2 | 2516.4 | 1733.0 |
| 57.5° | 1799.7 | 1820.7 | 1929.0 | 2005.4 | 2079.7 | 1996.3 | 1996.0 | 2286.4 | 2610.5 | 2649.5 | 1853.9 |
| 60°   | 1576.2 | 1604.8 | 1764.4 | 1933.7 | 2166.3 | 2239.5 | 2178.6 | 2401.6 | 2713.7 | 2781.3 | 2005.4 |
| 62.5° | 1125.7 | 1172.8 | 1389.1 | 1659.5 | 2047.6 | 2400.6 | 2550.2 | 2584.4 | 2854.1 | 2934.0 | 2202.3 |
| 65°   | 569.1  | 604.7  | 786.0  | 1111.7 | 1635.9 | 2295.3 | 2954.2 | 2984.6 | 3098.1 | 3169.1 | 2505.5 |
| 67.5° | 345.8  | 359.2  | 447.7  | 618.3  | 1002.9 | 1787.9 | 3086.0 | 3651.7 | 3570.3 | 3608.0 | 2937.9 |
| 70°   | 254.8  | 264.7  | 319.9  | 410.7  | 576.8  | 1049.2 | 2681.4 | 4127.8 | 4074.3 | 4070.1 | 3257.4 |
| 72°   | 198.4  | 205.7  | 254.4  | 331.8  | 421.8  | 629.4  | 1943.5 | 3952.1 | 4218.6 | 4197.4 | 3228.1 |
| 72.5° | 188.2  | 194.6  | 239.0  | 312.3  | 398.6  | 570.6  | 1747.4 | 3833.5 | 4208.2 | 4198.6 | 3190.3 |
| 75°   | 148.2  | 152.7  | 176.9  | 241.5  | 311.9  | 323.7  | 957.5  | 2970.8 | 3733.1 | 3888.3 | 2869.4 |
| 77.5° | 122.6  | 123.3  | 136.0  | 175.7  | 243.2  | 228.9  | 470.4  | 2061.2 | 2673.2 | 2843.9 | 2032.6 |
| 80°   | 99.9   | 100.7  | 106.8  | 123.3  | 184.0  | 169.3  | 223.3  | 1185.2 | 1496.7 | 1498.5 | 966.6  |
| 82.5° | 79.5   | 79.7   | 86.4   | 90.1   | 132.2  | 121.1  | 128.0  | 556.5  | 654.0  | 629.1  | 347.4  |
| 85°   | 56.0   | 54.8   | 84.4   | 74.0   | 86.4   | 77.7   | 70.6   | 220.3  | 270.4  | 258.6  | 108.8  |
| 87.5° | 18.7   | 19.3   | 37.5   | 47.9   | 50.4   | 44.1   | 31.4   | 84.4   | 102.1  | 101.2  | 34.5   |
| 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°    | 600.9  | 600.9 | 600.9 | 600.9 | 600.9 | 600.9 | 600.9 | 600.9 | 600.9 | 600.9 | 600.9 |
| 2.5°  | 603.9  | 598.5 | 590.6 | 581.9 | 575.0 | 567.9 | 562.7 | 560.0 | 557.0 | 554.4 | 557.5 |
| 5°    | 610.3  | 600.2 | 583.4 | 566.9 | 554.8 | 544.0 | 536.3 | 532.2 | 528.5 | 526.0 | 526.4 |
| 7.5°  | 620.7  | 604.4 | 576.1 | 552.1 | 535.3 | 523.7 | 515.8 | 513.1 | 510.7 | 510.0 | 510.9 |
| 10°   | 631.8  | 607.8 | 566.6 | 534.6 | 515.4 | 505.8 | 502.3 | 504.2 | 505.8 | 507.4 | 509.0 |
| 12.5° | 644.4  | 610.8 | 552.6 | 514.1 | 497.8 | 494.1 | 497.6 | 505.7 | 511.6 | 515.1 | 517.3 |
| 15°   | 660.9  | 613.5 | 536.5 | 493.6 | 482.6 | 486.8 | 498.8 | 512.7 | 523.0 | 529.6 | 530.6 |
| 17.5° | 676.0  | 613.3 | 515.8 | 472.9 | 470.4 | 482.6 | 500.6 | 520.3 | 534.1 | 543.3 | 545.2 |
| 20°   | 691.7  | 608.8 | 491.7 | 452.7 | 457.9 | 478.1 | 501.5 | 525.2 | 541.8 | 552.6 | 555.1 |
| 22.5° | 706.3  | 600.9 | 465.3 | 434.4 | 447.5 | 472.0 | 498.3 | 522.3 | 539.0 | 547.7 | 550.4 |
| 25°   | 716.2  | 587.1 | 438.6 | 418.9 | 438.2 | 464.6 | 487.9 | 507.2 | 519.6 | 524.0 | 524.7 |
| 27.5° | 721.3  | 569.1 | 413.4 | 405.4 | 428.7 | 452.5 | 468.5 | 478.1 | 481.6 | 481.3 | 480.6 |
| 30°   | 721.9  | 545.4 | 391.7 | 394.5 | 417.6 | 434.7 | 442.3 | 440.4 | 435.9 | 428.2 | 428.8 |
| 32.5° | 719.8  | 518.6 | 373.5 | 384.1 | 403.4 | 413.0 | 413.4 | 404.4 | 392.3 | 380.1 | 376.7 |
| 35°   | 720.4  | 492.4 | 357.5 | 372.3 | 386.3 | 390.5 | 386.6 | 373.5 | 357.0 | 341.2 | 337.8 |
| 37.5° | 727.8  | 469.5 | 343.7 | 358.7 | 367.3 | 368.3 | 362.7 | 348.9 | 336.8 | 321.4 | 320.0 |
| 40°   | 745.5  | 453.2 | 330.6 | 343.4 | 348.3 | 348.8 | 340.9 | 331.1 | 332.1 | 323.9 | 323.7 |
| 42.5° | 777.3  | 446.1 | 319.0 | 327.4 | 330.4 | 331.5 | 325.4 | 319.2 | 327.9 | 322.5 | 320.7 |
| 45°   | 818.3  | 447.8 | 309.3 | 311.8 | 317.3 | 322.0 | 318.3 | 310.8 | 314.1 | 290.8 | 283.0 |
| 47.5° | 865.7  | 458.6 | 301.5 | 298.3 | 307.9 | 316.8 | 311.1 | 299.7 | 287.7 | 264.5 | 260.2 |
| 50°   | 921.2  | 475.2 | 294.5 | 285.0 | 297.7 | 309.8 | 304.0 | 287.7 | 269.7 | 258.5 | 257.0 |
| 52.5° | 979.1  | 495.6 | 287.4 | 270.4 | 284.7 | 304.4 | 301.5 | 285.0 | 262.8 | 251.7 | 249.7 |
| 55°   | 1044.7 | 516.1 | 278.5 | 253.4 | 270.7 | 301.9 | 300.3 | 275.3 | 257.6 | 251.4 | 249.9 |
| 57.5° | 1126.2 | 539.5 | 266.7 | 235.8 | 257.6 | 292.8 | 288.1 | 269.4 | 252.2 | 247.5 | 247.0 |
| 60°   | 1232.5 | 574.0 | 249.7 | 216.9 | 241.7 | 278.8 | 277.8 | 260.8 | 243.7 | 240.3 | 239.6 |
| 62.5° | 1391.9 | 631.0 | 226.4 | 198.1 | 223.8 | 255.1 | 264.4 | 249.2 | 234.6 | 234.4 | 234.8 |
| 65°   | 1639.1 | 716.7 | 201.0 | 181.6 | 205.8 | 235.1 | 248.7 | 237.3 | 225.3 | 228.7 | 229.2 |
| 67.5° | 1925.7 | 787.9 | 176.1 | 165.5 | 187.5 | 216.1 | 234.6 | 225.3 | 213.1 | 221.8 | 222.0 |
| 70°   | 2021.0 | 724.3 | 154.2 | 149.5 | 168.5 | 197.8 | 219.3 | 212.2 | 199.8 | 208.5 | 207.7 |
| 72°   | 1880.8 | 584.7 | 140.1 | 137.4 | 154.2 | 182.6 | 205.7 | 200.0 | 187.7 | 193.6 | 191.4 |
| 72.5° | 1836.5 | 557.5 | 136.6 | 134.4 | 150.3 | 178.8 | 202.1 | 196.9 | 184.6 | 189.7 | 187.7 |
| 75°   | 1638.3 | 484.2 | 117.4 | 117.9 | 131.2 | 159.9 | 182.3 | 180.6 | 168.0 | 168.5 | 167.8 |
| 77.5° | 1188.3 | 355.0 | 98.9  | 102.2 | 111.7 | 140.6 | 162.3 | 161.3 | 147.5 | 145.0 | 144.5 |
| 80°   | 551.4  | 181.1 | 80.6  | 82.1  | 91.8  | 117.5 | 138.4 | 137.1 | 126.0 | 122.8 | 120.9 |
| 82.5° | 188.9  | 86.1  | 60.5  | 61.5  | 71.1  | 94.7  | 120.1 | 119.2 | 110.0 | 103.8 | 99.9  |
| 85°   | 67.4   | 42.9  | 42.4  | 41.4  | 50.8  | 74.5  | 104.6 | 100.1 | 86.4  | 73.7  | 73.3  |
| 87.5° | 21.9   | 18.3  | 21.9  | 21.7  | 29.6  | 50.4  | 76.0  | 64.7  | 62.7  | 52.1  | 51.1  |
| 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

(formerly Eaton)

INVUE

Report Number: SP1-2104-224-4

Luminaire Tested: CCW-SA-2A-750-U-SL4

Test Date: 05/04/2021



REPORT NUMBER: SP1-2104-224-4

| 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 5000K 7-step quadrangle

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### Photopic Flux vs. Wavelength

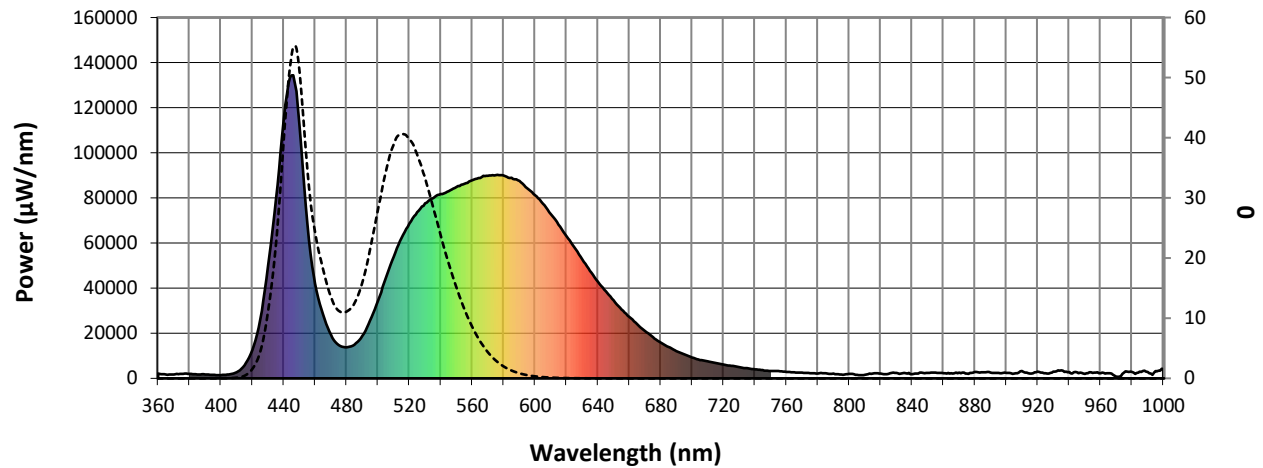


#####

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 2166             | 0.0              | 490       | 18819            | 2.7              | 620       | 63002            | 16.4             | 750       | 3328             | 0.0              | 880       | 2830             | 0.0              |
| 365       | 1672             | 0.0              | 495       | 25621            | 4.6              | 625       | 58119            | 12.8             | 755       | 3244             | 0.0              | 885       | 2751             | 0.0              |
| 370       | 1688             | 0.0              | 500       | 34501            | 7.6              | 630       | 52745            | 9.5              | 760       | 2856             | 0.0              | 890       | 2579             | 0.0              |
| 375       | 2041             | 0.0              | 505       | 44365            | 12.4             | 635       | 47707            | 7.2              | 765       | 2696             | 0.0              | 895       | 2461             | 0.0              |
| 380       | 1996             | 0.0              | 510       | 53923            | 18.5             | 640       | 42815            | 5.1              | 770       | 2495             | 0.0              | 900       | 2372             | 0.0              |
| 385       | 1720             | 0.0              | 515       | 62101            | 25.7             | 645       | 38643            | 3.7              | 775       | 2247             | 0.0              | 905       | 2190             | 0.0              |
| 390       | 1706             | 0.0              | 520       | 68661            | 33.3             | 650       | 34557            | 2.5              | 780       | 2133             | 0.0              | 910       | 3204             | 0.0              |
| 395       | 1550             | 0.0              | 525       | 73606            | 39.5             | 655       | 30447            | 1.7              | 785       | 2276             | 0.0              | 915       | 2069             | 0.0              |
| 400       | 1444             | 0.0              | 530       | 77628            | 45.7             | 660       | 27287            | 1.1              | 790       | 2093             | 0.0              | 920       | 2977             | 0.0              |
| 405       | 1761             | 0.0              | 535       | 79955            | 49.6             | 665       | 24046            | 0.8              | 795       | 1681             | 0.0              | 925       | 2332             | 0.0              |
| 410       | 2694             | 0.0              | 540       | 81715            | 53.2             | 670       | 20995            | 0.5              | 800       | 2044             | 0.0              | 930       | 2929             | 0.0              |
| 415       | 5767             | 0.0              | 545       | 83067            | 55.3             | 675       | 18242            | 0.3              | 805       | 1519             | 0.0              | 935       | 3495             | 0.0              |
| 420       | 12476            | 0.0              | 550       | 84799            | 57.6             | 680       | 15871            | 0.2              | 810       | 1549             | 0.0              | 940       | 2810             | 0.0              |
| 425       | 26189            | 0.1              | 555       | 86279            | 58.9             | 685       | 13910            | 0.1              | 815       | 2097             | 0.0              | 945       | 2657             | 0.0              |
| 430       | 49608            | 0.4              | 560       | 87792            | 59.7             | 690       | 12111            | 0.1              | 820       | 2098             | 0.0              | 950       | 1935             | 0.0              |
| 435       | 79442            | 0.9              | 565       | 88893            | 59.1             | 695       | 10644            | 0.0              | 825       | 2049             | 0.0              | 955       | 2408             | 0.0              |
| 440       | 114477           | 1.8              | 570       | 89760            | 58.4             | 700       | 9267             | 0.0              | 830       | 2352             | 0.0              | 960       | 2331             | 0.0              |
| 445       | 134358           | 2.8              | 575       | 90097            | 56.1             | 705       | 8161             | 0.0              | 835       | 2358             | 0.0              | 965       | 2231             | 0.0              |
| 450       | 112862           | 2.9              | 580       | 90008            | 53.5             | 710       | 7567             | 0.0              | 840       | 1853             | 0.0              | 970       | 688              | 0.0              |
| 455       | 68630            | 2.3              | 585       | 88925            | 49.4             | 715       | 6794             | 0.0              | 845       | 2553             | 0.0              | 975       | 2537             | 0.0              |
| 460       | 41987            | 1.7              | 590       | 87580            | 45.3             | 720       | 6069             | 0.0              | 850       | 2413             | 0.0              | 980       | 2826             | 0.0              |
| 465       | 28353            | 1.5              | 595       | 84246            | 39.9             | 725       | 5588             | 0.0              | 855       | 2597             | 0.0              | 985       | 3000             | 0.0              |
| 470       | 19290            | 1.2              | 600       | 81176            | 35.0             | 730       | 4999             | 0.0              | 860       | 2269             | 0.0              | 990       | 2880             | 0.0              |
| 475       | 14790            | 1.2              | 605       | 77529            | 30.0             | 735       | 4495             | 0.0              | 865       | 2210             | 0.0              | 995       | 3332             | 0.0              |
| 480       | 13767            | 1.3              | 610       | 72750            | 25.0             | 740       | 4033             | 0.0              | 870       | 2564             | 0.0              | 1000      | 4187             | 0.0              |
| 485       | 14964            | 1.8              | 615       | 68174            | 20.6             | 745       | 3625             | 0.0              | 875       | 2169             | 0.0              |           |                  |                  |

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### Scotopic Flux vs. Wavelength



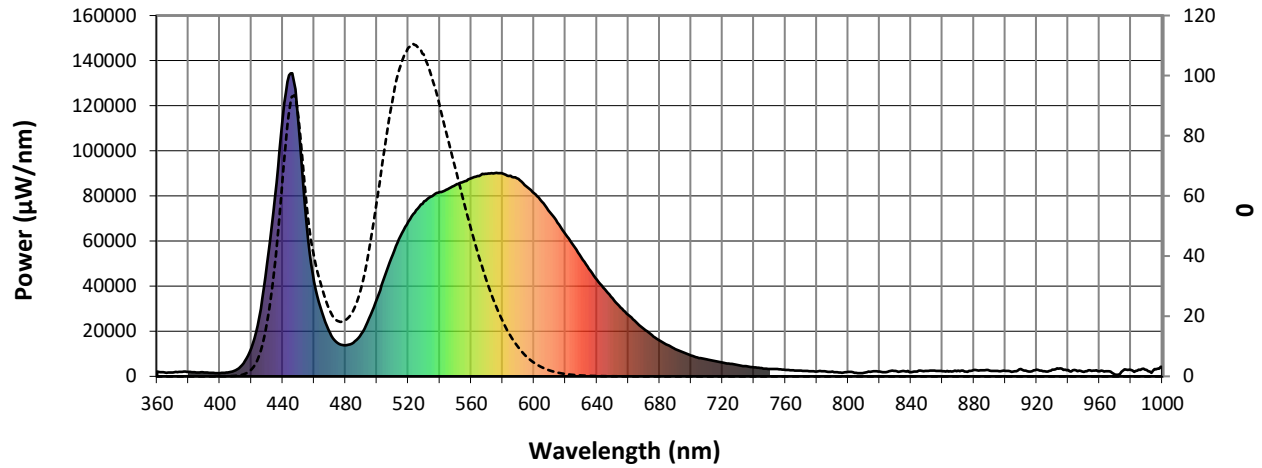
Scotopic Lumens: 9214.6

S/P: 1.71

| 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       | 2166             | 0.0              | 490       | 18819            | 29.0             | 620       | 63002            | 0.8              | 750       | 3328             | 0.0              | 880       | 2830             | 0.0              |
| 365       | 1672             | 0.0              | 495       | 25621            | 41.4             | 625       | 58119            | 0.5              | 755       | 3244             | 0.0              | 885       | 2751             | 0.0              |
| 370       | 1688             | 0.0              | 500       | 34501            | 57.7             | 630       | 52745            | 0.3              | 760       | 2856             | 0.0              | 890       | 2579             | 0.0              |
| 375       | 2041             | 0.0              | 505       | 44365            | 75.4             | 635       | 47707            | 0.2              | 765       | 2696             | 0.0              | 895       | 2461             | 0.0              |
| 380       | 1996             | 0.0              | 510       | 53923            | 91.4             | 640       | 42815            | 0.1              | 770       | 2495             | 0.0              | 900       | 2372             | 0.0              |
| 385       | 1720             | 0.0              | 515       | 62101            | 102.9            | 645       | 38643            | 0.1              | 775       | 2247             | 0.0              | 905       | 2190             | 0.0              |
| 390       | 1706             | 0.0              | 520       | 68661            | 109.1            | 650       | 34557            | 0.0              | 780       | 2133             | 0.0              | 910       | 3204             | 0.0              |
| 395       | 1550             | 0.0              | 525       | 73606            | 110.1            | 655       | 30447            | 0.0              | 785       | 2276             | 0.0              | 915       | 2069             | 0.0              |
| 400       | 1444             | 0.0              | 530       | 77628            | 107.0            | 660       | 27287            | 0.0              | 790       | 2093             | 0.0              | 920       | 2977             | 0.0              |
| 405       | 1761             | 0.1              | 535       | 79955            | 99.6             | 665       | 24046            | 0.0              | 795       | 1681             | 0.0              | 925       | 2332             | 0.0              |
| 410       | 2694             | 0.2              | 540       | 81715            | 90.3             | 670       | 20995            | 0.0              | 800       | 2044             | 0.0              | 930       | 2929             | 0.0              |
| 415       | 5767             | 0.6              | 545       | 83067            | 79.6             | 675       | 18242            | 0.0              | 805       | 1519             | 0.0              | 935       | 3495             | 0.0              |
| 420       | 12476            | 2.1              | 550       | 84799            | 69.3             | 680       | 15871            | 0.0              | 810       | 1549             | 0.0              | 940       | 2810             | 0.0              |
| 425       | 26189            | 6.4              | 555       | 86279            | 59.0             | 685       | 13910            | 0.0              | 815       | 2097             | 0.0              | 945       | 2657             | 0.0              |
| 430       | 49608            | 16.9             | 560       | 87792            | 49.1             | 690       | 12111            | 0.0              | 820       | 2098             | 0.0              | 950       | 1935             | 0.0              |
| 435       | 79442            | 35.5             | 565       | 88893            | 39.9             | 695       | 10644            | 0.0              | 825       | 2049             | 0.0              | 955       | 2408             | 0.0              |
| 440       | 114477           | 64.0             | 570       | 89760            | 31.7             | 700       | 9267             | 0.0              | 830       | 2352             | 0.0              | 960       | 2331             | 0.0              |
| 445       | 134358           | 90.0             | 575       | 90097            | 24.5             | 705       | 8161             | 0.0              | 835       | 2358             | 0.0              | 965       | 2231             | 0.0              |
| 450       | 112862           | 87.5             | 580       | 90008            | 18.5             | 710       | 7567             | 0.0              | 840       | 1853             | 0.0              | 970       | 688              | 0.0              |
| 455       | 68630            | 60.0             | 585       | 88925            | 13.6             | 715       | 6794             | 0.0              | 845       | 2553             | 0.0              | 975       | 2537             | 0.0              |
| 460       | 41987            | 40.6             | 590       | 87580            | 9.8              | 720       | 6069             | 0.0              | 850       | 2413             | 0.0              | 980       | 2826             | 0.0              |
| 465       | 28353            | 29.9             | 595       | 84246            | 6.7              | 725       | 5588             | 0.0              | 855       | 2597             | 0.0              | 985       | 3000             | 0.0              |
| 470       | 19290            | 22.2             | 600       | 81176            | 4.6              | 730       | 4999             | 0.0              | 860       | 2269             | 0.0              | 990       | 2880             | 0.0              |
| 475       | 14790            | 18.5             | 605       | 77529            | 3.0              | 735       | 4495             | 0.0              | 865       | 2210             | 0.0              | 995       | 3332             | 0.0              |
| 480       | 13767            | 18.6             | 610       | 72750            | 2.0              | 740       | 4033             | 0.0              | 870       | 2564             | 0.0              | 1000      | 4187             | 0.0              |
| 485       | 14964            | 21.7             | 615       | 68174            | 1.3              | 745       | 3625             | 0.0              | 875       | 2169             | 0.0              |           |                  |                  |

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### Melanopic Flux vs. Wavelength


**Melanopic Lumens: 3619.9**
**M/P: 0.67**

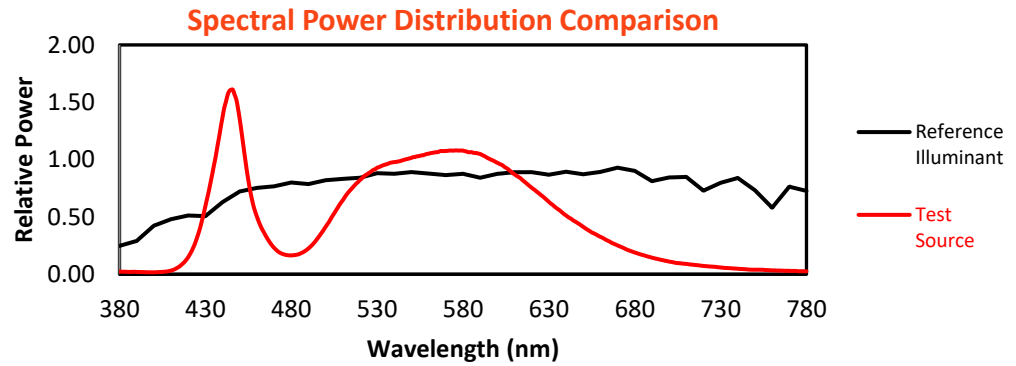
| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 2166             | 0.0              | 490       | 18819            | 15.7             | 620       | 63002            | 0.0              | 750       | 3328             | 0.0              | 880       | 2830             | 0.0              |
| 365       | 1672             | 0.0              | 495       | 25621            | 21.2             | 625       | 58119            | 0.0              | 755       | 3244             | 0.0              | 885       | 2751             | 0.0              |
| 370       | 1688             | 0.0              | 500       | 34501            | 27.7             | 630       | 52745            | 0.0              | 760       | 2856             | 0.0              | 890       | 2579             | 0.0              |
| 375       | 2041             | 0.0              | 505       | 44365            | 34.0             | 635       | 47707            | 0.0              | 765       | 2696             | 0.0              | 895       | 2461             | 0.0              |
| 380       | 1996             | 0.0              | 510       | 53923            | 38.7             | 640       | 42815            | 0.0              | 770       | 2495             | 0.0              | 900       | 2372             | 0.0              |
| 385       | 1720             | 0.0              | 515       | 62101            | 40.6             | 645       | 38643            | 0.0              | 775       | 2247             | 0.0              | 905       | 2190             | 0.0              |
| 390       | 1706             | 0.0              | 520       | 68661            | 40.0             | 650       | 34557            | 0.0              | 780       | 2133             | 0.0              | 910       | 3204             | 0.0              |
| 395       | 1550             | 0.0              | 525       | 73606            | 37.3             | 655       | 30447            | 0.0              | 785       | 2276             | 0.0              | 915       | 2069             | 0.0              |
| 400       | 1444             | 0.0              | 530       | 77628            | 33.5             | 660       | 27287            | 0.0              | 790       | 2093             | 0.0              | 920       | 2977             | 0.0              |
| 405       | 1761             | 0.0              | 535       | 79955            | 28.8             | 665       | 24046            | 0.0              | 795       | 1681             | 0.0              | 925       | 2332             | 0.0              |
| 410       | 2694             | 0.1              | 540       | 81715            | 23.9             | 670       | 20995            | 0.0              | 800       | 2044             | 0.0              | 930       | 2929             | 0.0              |
| 415       | 5767             | 0.4              | 545       | 83067            | 19.3             | 675       | 18242            | 0.0              | 805       | 1519             | 0.0              | 935       | 3495             | 0.0              |
| 420       | 12476            | 1.4              | 550       | 84799            | 15.2             | 680       | 15871            | 0.0              | 810       | 1549             | 0.0              | 940       | 2810             | 0.0              |
| 425       | 26189            | 4.1              | 555       | 86279            | 11.6             | 685       | 13910            | 0.0              | 815       | 2097             | 0.0              | 945       | 2657             | 0.0              |
| 430       | 49608            | 10.5             | 560       | 87792            | 8.7              | 690       | 12111            | 0.0              | 820       | 2098             | 0.0              | 950       | 1935             | 0.0              |
| 435       | 79442            | 21.2             | 565       | 88893            | 6.2              | 695       | 10644            | 0.0              | 825       | 2049             | 0.0              | 955       | 2408             | 0.0              |
| 440       | 114477           | 38.3             | 570       | 89760            | 4.4              | 700       | 9267             | 0.0              | 830       | 2352             | 0.0              | 960       | 2331             | 0.0              |
| 445       | 134358           | 53.0             | 575       | 90097            | 3.0              | 705       | 8161             | 0.0              | 835       | 2358             | 0.0              | 965       | 2231             | 0.0              |
| 450       | 112862           | 52.0             | 580       | 90008            | 2.0              | 710       | 7567             | 0.0              | 840       | 1853             | 0.0              | 970       | 688              | 0.0              |
| 455       | 68630            | 36.0             | 585       | 88925            | 1.3              | 715       | 6794             | 0.0              | 845       | 2553             | 0.0              | 975       | 2537             | 0.0              |
| 460       | 41987            | 24.7             | 590       | 87580            | 0.9              | 720       | 6069             | 0.0              | 850       | 2413             | 0.0              | 980       | 2826             | 0.0              |
| 465       | 28353            | 18.5             | 595       | 84246            | 0.5              | 725       | 5588             | 0.0              | 855       | 2597             | 0.0              | 985       | 3000             | 0.0              |
| 470       | 19290            | 13.8             | 600       | 81176            | 0.3              | 730       | 4999             | 0.0              | 860       | 2269             | 0.0              | 990       | 2880             | 0.0              |
| 475       | 14790            | 11.3             | 605       | 77529            | 0.2              | 735       | 4495             | 0.0              | 865       | 2210             | 0.0              | 995       | 3332             | 0.0              |
| 480       | 13767            | 11.1             | 610       | 72750            | 0.1              | 740       | 4033             | 0.0              | 870       | 2564             | 0.0              | 1000      | 4187             | 0.0              |
| 485       | 14964            | 12.3             | 615       | 68174            | 0.1              | 745       | 3625             | 0.0              | 875       | 2169             | 0.0              |           |                  |                  |

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TM-30-18

### Summary

$R_f = 72.7$   
 $R_g = 96.4$   
 $CIE R_a = 71.8$   
 $R_g = -28.1$



### Color Vector Graphics





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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 57 | CES51 = 89 | CES76 = 45 |
| CES02 = 60 | CES27 = 82 | CES52 = 89 | CES77 = 66 |
| CES03 = 30 | CES28 = 78 | CES53 = 76 | CES78 = 48 |
| CES04 = 69 | CES29 = 55 | CES54 = 82 | CES79 = 76 |
| CES05 = 46 | CES30 = 66 | CES55 = 82 | CES80 = 73 |
| CES06 = 50 | CES31 = 60 | CES56 = 71 | CES81 = 75 |
| CES07 = 39 | CES32 = 54 | CES57 = 69 | CES82 = 89 |
| CES08 = 38 | CES33 = 67 | CES58 = 71 | CES83 = 85 |
| CES09 = 29 | CES34 = 65 | CES59 = 87 | CES84 = 87 |
| CES10 = 73 | CES35 = 80 | CES60 = 92 | CES85 = 82 |
| CES11 = 56 | CES36 = 97 | CES61 = 86 | CES86 = 75 |
| CES12 = 62 | CES37 = 74 | CES62 = 84 | CES87 = 76 |
| CES13 = 42 | CES38 = 76 | CES63 = 73 | CES88 = 78 |
| CES14 = 74 | CES39 = 93 | CES64 = 70 | CES89 = 74 |
| CES15 = 70 | CES40 = 86 | CES65 = 64 | CES90 = 76 |
| CES16 = 46 | CES41 = 87 | CES66 = 64 | CES91 = 86 |
| CES17 = 49 | CES42 = 73 | CES67 = 61 | CES92 = 66 |
| CES18 = 55 | CES43 = 71 | CES68 = 68 | CES93 = 80 |
| CES19 = 71 | CES44 = 98 | CES69 = 78 | CES94 = 57 |
| CES20 = 64 | CES45 = 81 | CES70 = 57 | CES95 = 70 |
| CES21 = 85 | CES46 = 80 | CES71 = 53 | CES96 = 78 |
| CES22 = 77 | CES47 = 78 | CES72 = 84 | CES97 = 84 |
| CES23 = 91 | CES48 = 71 | CES73 = 47 | CES98 = 73 |
| CES24 = 90 | CES49 = 79 | CES74 = 95 | CES99 = 62 |
| CES25 = 71 | CES50 = 87 | CES75 = 51 |            |



Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)