

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



Scaled data based on original data using  
LM-79-08 Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Test Report Prepared for  
Cooper Lighting Solutions  
(formerly Eaton)

Brand: McGRAW-EDISON

Report Number: P385425

Luminaire Tested: **GWC-SA1A-722-U-T4W**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P385425  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-18)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: MCGRAW-EDISON  
Catalog Number: GWC-SA1A-722-U-T4W  
Description: GALLEON WALL LUMINAIRE  
(1) 70 CRI, 2200K, 615mA LIGHTSQUARE WITH 16 LEDS AND TYPE IV WIDE OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 3633 lumens  
Efficiency: N/A  
Efficacy: 106.9 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 0.5' x H: 0')  
IES Classification: Type IV - Short  
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

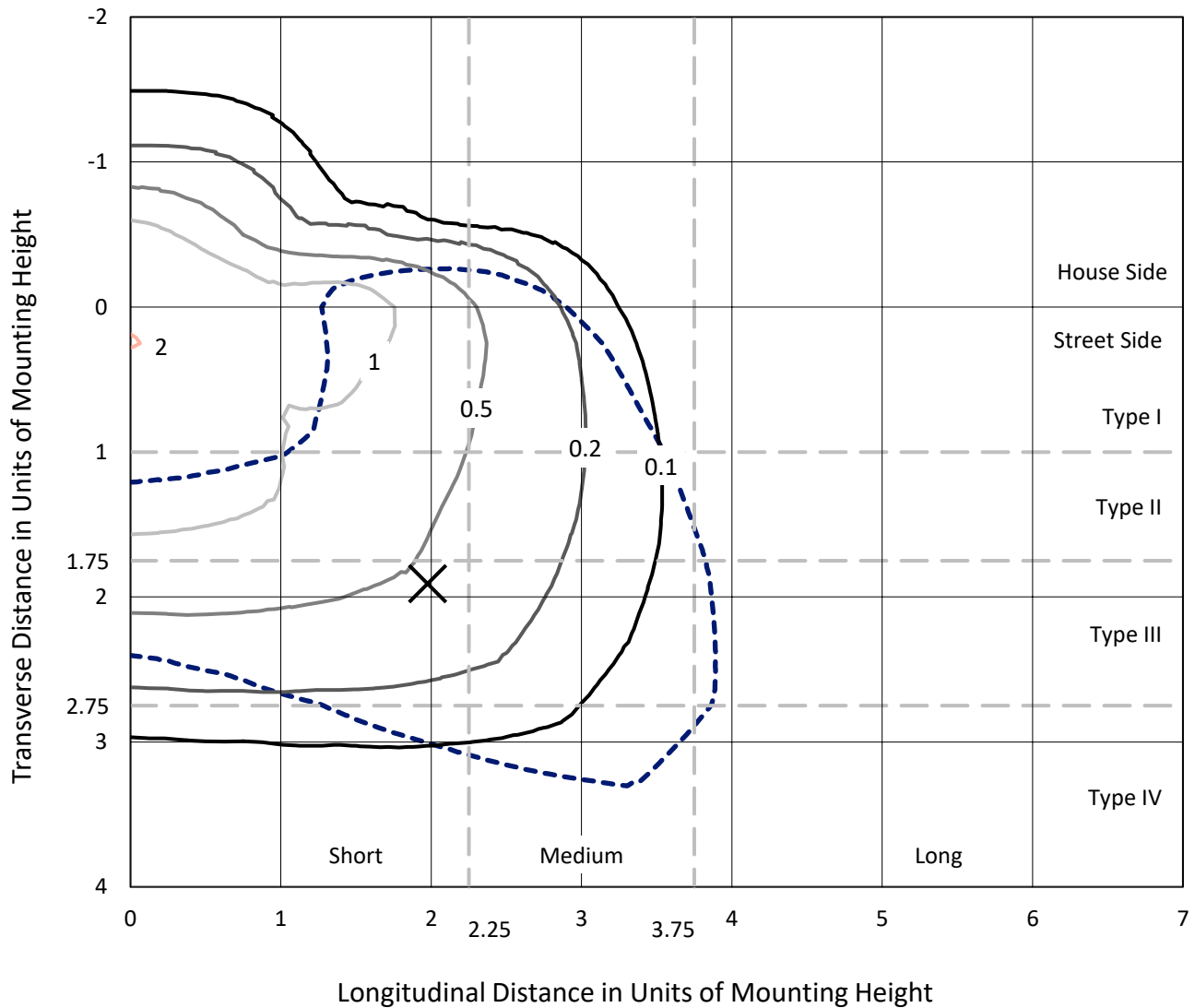


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## Iso-Footcandle Lines of Horizontal Illumination

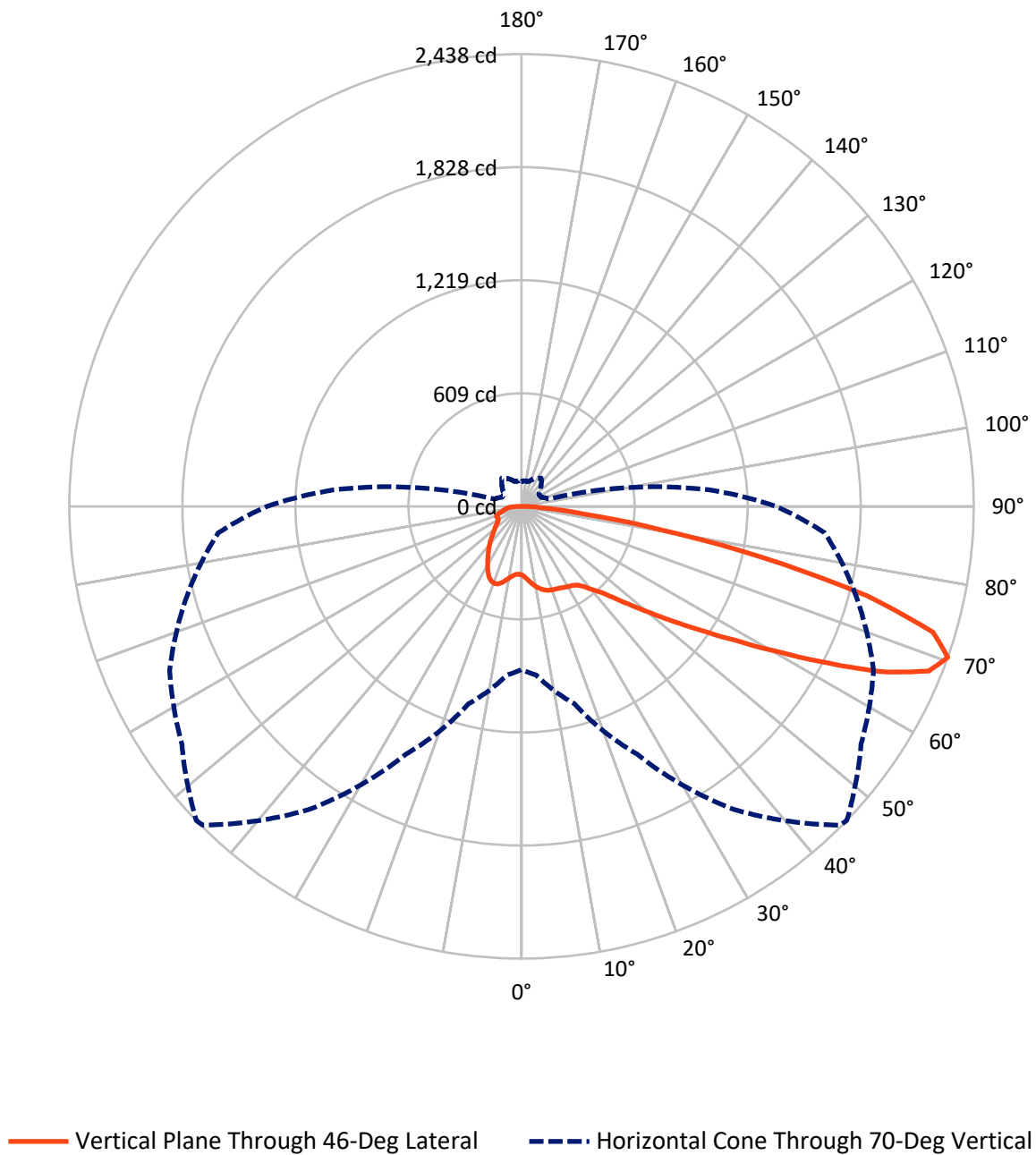
✕ Max cd  
 --- 1/2 Max cd



Based on 15 foot mounting height. Maximum calculated value = 2.1 fc  
 Type IV - Short - N/A

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## Luminous Intensity Polar Plot



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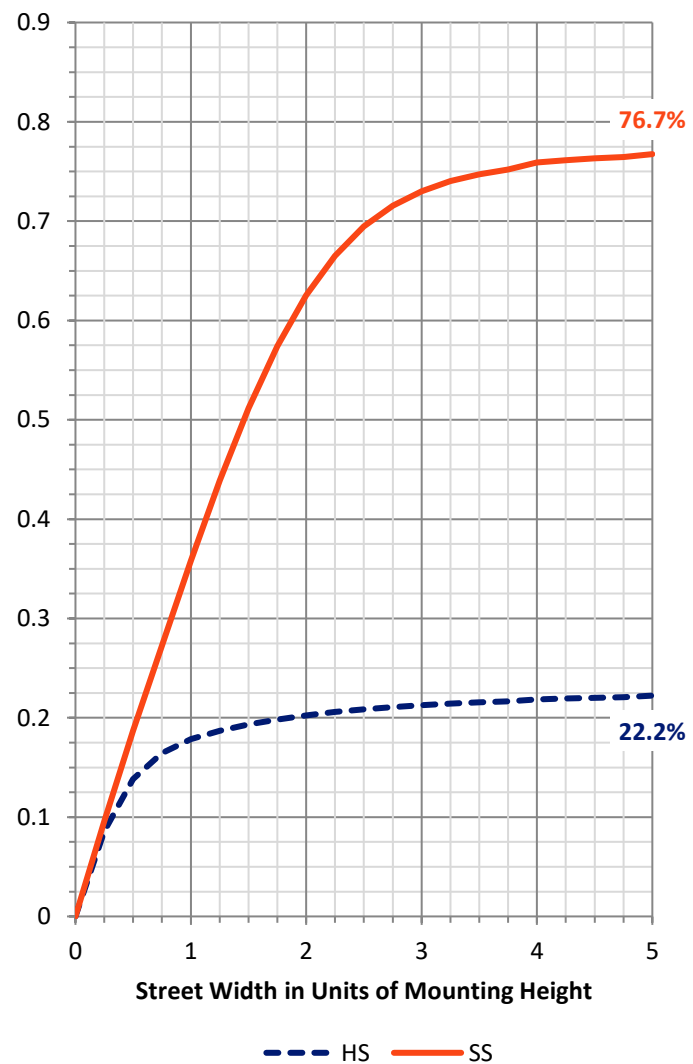
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 832.7    | 0.0    | 832.7  |
|                    | % Fixture | 22.9     | 0.0    | 22.9   |
| <b>Street Side</b> | Lumens    | 2800.3   | 0.0    | 2800.3 |
|                    | % Fixture | 77.1     | 0.0    | 77.1   |
| <b>Total</b>       | Lumens    | 3633.0   | 0.0    | 3633.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 37.7   | 1.0       |
| 10°-20°   | 125.7  | 3.5       |
| 20°-30°   | 209.6  | 5.8       |
| 30°-40°   | 297.5  | 8.2       |
| 40°-50°   | 437.5  | 12.0      |
| 50°-60°   | 741.0  | 20.4      |
| 60°-70°   | 1051.8 | 29.0      |
| 70°-80°   | 639.0  | 17.6      |
| 80°-90°   | 93.3   | 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°    | 3633.0 | 100.0     |
| 0°-180°   | 3633.0 | 100.0     |

**Coefficient of Utilization**



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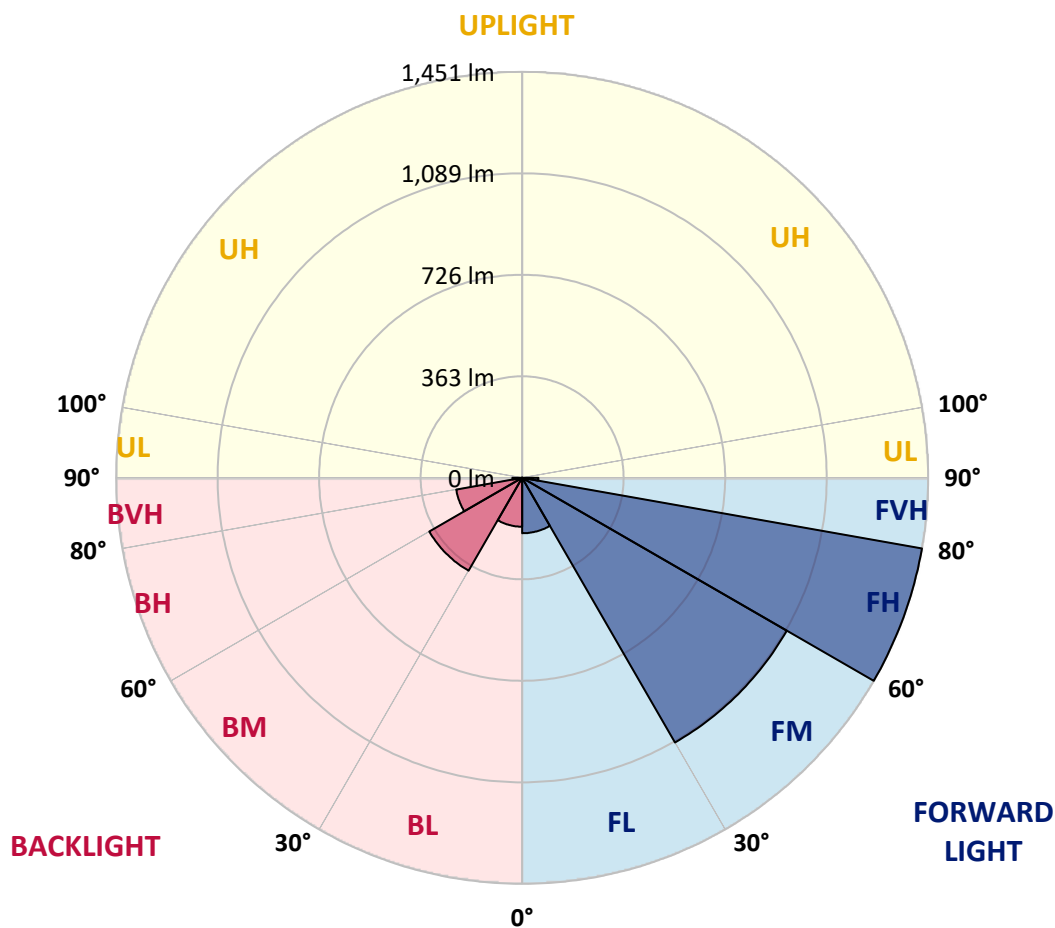
CATALOG NUMBER: GWC-SA1A-722-U-T4W

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 198.2  | 5.5       |                         |      |         |
| FM   | (30°-60°)   | 1092.6 | 30.1      |                         |      |         |
| FH   | (60°-80°)   | 1451.4 | 39.9      |                         |      | G1/1800 |
| FVH  | (80°-90°)   | 58.1   | 1.6       |                         |      | G1/100  |
| BL   | (0°-30°)    | 174.8  | 4.8       | B1/500                  |      |         |
| BM   | (30°-60°)   | 383.3  | 10.6      | B1/1000                 |      |         |
| BH   | (60°-80°)   | 239.4  | 6.6       | B1/500                  |      | G1/500  |
| BVH  | (80°-90°)   | 35.2   | 1.0       |                         |      | 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 IV Short



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 46°    | 55°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 370.1  | 370.1  | 370.1  | 370.1  | 370.1  | 370.1  | 370.1  | 370.1  | 370.1  | 370.1  | 370.1  |
| 2.5°  | 388.7  | 388.9  | 389.4  | 388.2  | 384.7  | 383.7  | 383.3  | 379.7  | 377.3  | 373.9  | 370.9  |
| 5°    | 419.7  | 420.0  | 419.2  | 415.8  | 408.1  | 402.3  | 401.8  | 393.6  | 386.2  | 378.2  | 372.2  |
| 7.5°  | 452.2  | 452.6  | 450.2  | 443.6  | 432.8  | 422.8  | 422.2  | 411.0  | 399.7  | 387.7  | 378.7  |
| 10°   | 480.9  | 479.4  | 475.6  | 466.4  | 453.6  | 441.4  | 440.9  | 429.2  | 416.1  | 401.6  | 389.7  |
| 12.5° | 500.1  | 498.8  | 493.8  | 482.7  | 468.6  | 457.4  | 456.4  | 445.6  | 432.9  | 417.0  | 402.7  |
| 15°   | 510.6  | 511.5  | 504.8  | 492.1  | 478.4  | 469.0  | 468.1  | 460.4  | 449.1  | 433.0  | 416.6  |
| 17.5° | 512.0  | 512.7  | 506.3  | 493.7  | 482.5  | 476.1  | 475.7  | 470.6  | 462.4  | 447.0  | 429.8  |
| 20°   | 504.0  | 504.5  | 499.2  | 488.9  | 481.5  | 479.5  | 479.4  | 477.2  | 471.1  | 457.4  | 440.8  |
| 22.5° | 492.5  | 492.8  | 489.0  | 481.5  | 479.0  | 482.2  | 483.0  | 482.2  | 477.8  | 465.0  | 449.3  |
| 25°   | 489.6  | 489.4  | 485.4  | 477.8  | 479.9  | 486.5  | 487.6  | 488.0  | 485.0  | 473.8  | 460.3  |
| 27.5° | 503.4  | 502.5  | 495.0  | 482.8  | 484.1  | 492.1  | 493.6  | 497.2  | 495.3  | 485.5  | 472.7  |
| 30°   | 543.3  | 541.8  | 526.3  | 501.7  | 495.0  | 499.1  | 500.9  | 506.6  | 507.0  | 498.8  | 489.2  |
| 32.5° | 610.7  | 608.8  | 581.0  | 537.0  | 513.2  | 506.1  | 507.9  | 516.5  | 521.1  | 514.7  | 504.4  |
| 35°   | 695.9  | 693.8  | 657.2  | 597.0  | 543.8  | 519.7  | 520.9  | 527.8  | 537.0  | 528.0  | 514.4  |
| 37.5° | 784.6  | 779.6  | 744.4  | 667.7  | 592.4  | 548.7  | 548.7  | 549.5  | 553.9  | 535.2  | 526.0  |
| 40°   | 872.9  | 867.8  | 836.0  | 750.7  | 655.3  | 594.3  | 591.4  | 572.2  | 568.7  | 552.6  | 549.5  |
| 42.5° | 955.0  | 953.5  | 934.7  | 844.6  | 729.2  | 639.2  | 635.2  | 602.5  | 603.3  | 593.3  | 593.4  |
| 45°   | 1042.3 | 1042.3 | 1027.0 | 939.3  | 815.2  | 711.3  | 707.3  | 659.2  | 666.7  | 662.1  | 673.1  |
| 47.5° | 1113.5 | 1115.7 | 1113.6 | 1038.0 | 915.3  | 802.9  | 795.7  | 737.8  | 758.7  | 774.5  | 806.7  |
| 50°   | 1186.2 | 1189.7 | 1190.1 | 1146.3 | 1036.3 | 911.8  | 903.6  | 842.1  | 888.7  | 934.0  | 997.3  |
| 52.5° | 1291.8 | 1299.6 | 1268.4 | 1254.4 | 1184.5 | 1041.1 | 1033.1 | 976.2  | 1054.1 | 1117.6 | 1226.6 |
| 55°   | 1389.6 | 1382.8 | 1360.5 | 1369.3 | 1343.1 | 1188.3 | 1182.3 | 1132.4 | 1238.3 | 1320.9 | 1462.5 |
| 57.5° | 1442.6 | 1442.1 | 1464.5 | 1501.8 | 1514.2 | 1369.9 | 1364.8 | 1316.3 | 1446.1 | 1508.1 | 1683.9 |
| 60°   | 1504.8 | 1505.6 | 1561.1 | 1645.8 | 1697.0 | 1595.9 | 1593.7 | 1556.9 | 1647.9 | 1682.9 | 1857.6 |
| 62.5° | 1513.5 | 1529.1 | 1624.6 | 1770.3 | 1868.1 | 1860.0 | 1865.0 | 1773.6 | 1828.4 | 1822.4 | 1987.3 |
| 65°   | 1413.4 | 1434.0 | 1606.8 | 1808.0 | 2038.1 | 2148.8 | 2153.4 | 1991.5 | 1970.8 | 1941.7 | 2033.7 |
| 67.5° | 1208.2 | 1238.8 | 1426.6 | 1726.1 | 2094.2 | 2362.3 | 2368.7 | 2160.5 | 2088.9 | 1982.1 | 1922.0 |
| 70°   | 879.3  | 913.2  | 1102.2 | 1474.2 | 1994.3 | 2430.5 | 2437.9 | 2235.2 | 2093.4 | 1867.1 | 1640.8 |
| 72.5° | 531.1  | 557.7  | 713.5  | 1085.3 | 1683.2 | 2306.2 | 2319.3 | 2140.5 | 1911.2 | 1581.5 | 1211.6 |
| 75°   | 233.2  | 250.7  | 345.0  | 625.4  | 1205.0 | 1908.1 | 1924.4 | 1832.1 | 1552.9 | 1149.3 | 716.1  |
| 77.5° | 99.3   | 104.3  | 141.5  | 271.7  | 681.2  | 1303.9 | 1326.2 | 1338.7 | 1053.6 | 625.4  | 302.6  |
| 80°   | 61.9   | 63.9   | 80.1   | 123.0  | 318.8  | 732.3  | 756.4  | 787.6  | 523.2  | 229.9  | 105.7  |
| 82.5° | 37.7   | 39.9   | 53.2   | 74.3   | 166.0  | 332.0  | 343.5  | 365.5  | 203.0  | 99.3   | 54.7   |
| 85°   | 22.6   | 24.2   | 32.6   | 47.0   | 94.5   | 130.5  | 130.4  | 144.2  | 95.6   | 63.9   | 28.8   |
| 87.5° | 10.8   | 12.1   | 17.4   | 24.4   | 47.6   | 49.0   | 45.9   | 52.0   | 58.1   | 41.9   | 14.5   |
| 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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CATALOG NUMBER: GWC-SA1A-722-U-T4W

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 370.1  | 370.1  | 370.1 | 370.1 | 370.1 | 370.1 | 370.1 | 370.1 | 370.1 | 370.1 | 370.1 |
| 2.5°  | 369.9  | 369.4  | 367.8 | 366.5 | 366.3 | 365.5 | 364.9 | 365.3 | 365.8 | 365.9 | 365.9 |
| 5°    | 369.8  | 368.4  | 366.3 | 365.4 | 366.5 | 368.0 | 369.9 | 372.4 | 373.9 | 375.0 | 375.7 |
| 7.5°  | 375.7  | 373.1  | 370.8 | 370.3 | 372.5 | 376.5 | 380.7 | 385.9 | 389.5 | 392.0 | 392.5 |
| 10°   | 385.7  | 382.4  | 380.1 | 380.6 | 384.6 | 390.3 | 396.2 | 403.0 | 408.4 | 411.8 | 412.0 |
| 12.5° | 397.1  | 394.0  | 391.8 | 393.9 | 400.5 | 407.4 | 413.6 | 419.5 | 424.5 | 427.8 | 427.8 |
| 15°   | 410.3  | 408.1  | 405.4 | 410.3 | 419.2 | 425.5 | 428.1 | 430.9 | 433.7 | 436.2 | 435.7 |
| 17.5° | 423.0  | 420.9  | 419.5 | 425.2 | 434.5 | 437.4 | 435.7 | 433.5 | 433.5 | 434.9 | 435.2 |
| 20°   | 433.9  | 432.0  | 432.9 | 438.5 | 443.4 | 440.4 | 433.9 | 427.2 | 424.5 | 425.2 | 426.0 |
| 22.5° | 443.5  | 442.6  | 445.2 | 447.8 | 444.4 | 433.9 | 422.0 | 412.9 | 409.5 | 409.3 | 409.5 |
| 25°   | 454.7  | 454.6  | 457.8 | 453.1 | 437.6 | 418.4 | 402.3 | 393.5 | 391.6 | 393.1 | 395.6 |
| 27.5° | 468.6  | 470.0  | 471.6 | 454.3 | 424.0 | 394.9 | 378.6 | 372.5 | 374.4 | 378.0 | 380.3 |
| 30°   | 486.4  | 490.1  | 486.6 | 451.2 | 404.3 | 368.0 | 352.5 | 350.7 | 355.8 | 360.9 | 363.4 |
| 32.5° | 503.7  | 509.5  | 501.1 | 443.1 | 379.0 | 339.5 | 327.5 | 327.0 | 333.2 | 338.2 | 341.7 |
| 35°   | 517.6  | 529.2  | 511.9 | 427.1 | 349.6 | 313.3 | 304.5 | 301.1 | 303.4 | 309.2 | 313.2 |
| 37.5° | 535.7  | 555.0  | 519.3 | 402.6 | 317.8 | 291.7 | 281.4 | 273.7 | 271.7 | 274.0 | 276.0 |
| 40°   | 568.9  | 594.4  | 522.8 | 368.4 | 286.7 | 270.0 | 259.6 | 248.3 | 240.5 | 234.7 | 234.9 |
| 42.5° | 623.1  | 645.8  | 520.6 | 326.9 | 258.0 | 248.9 | 237.1 | 224.0 | 211.4 | 198.4 | 197.4 |
| 45°   | 711.2  | 722.1  | 513.9 | 282.9 | 232.7 | 226.8 | 215.7 | 202.7 | 185.7 | 171.1 | 169.7 |
| 47.5° | 852.0  | 827.8  | 503.4 | 244.4 | 210.5 | 208.0 | 197.8 | 182.8 | 164.9 | 153.1 | 152.1 |
| 50°   | 1044.1 | 980.3  | 498.3 | 213.8 | 190.8 | 191.6 | 183.3 | 167.3 | 150.4 | 141.7 | 140.7 |
| 52.5° | 1273.9 | 1158.0 | 508.1 | 190.2 | 175.1 | 177.7 | 171.5 | 156.5 | 142.4 | 135.5 | 134.5 |
| 55°   | 1512.2 | 1342.0 | 518.7 | 173.1 | 160.1 | 165.2 | 163.1 | 150.8 | 138.0 | 131.7 | 130.8 |
| 57.5° | 1716.3 | 1479.4 | 497.6 | 159.1 | 146.8 | 154.8 | 156.7 | 147.2 | 135.8 | 130.0 | 129.1 |
| 60°   | 1844.7 | 1534.7 | 442.1 | 146.1 | 136.3 | 146.5 | 152.9 | 146.2 | 136.6 | 136.1 | 135.4 |
| 62.5° | 1905.6 | 1529.9 | 358.9 | 135.8 | 129.7 | 142.9 | 155.7 | 151.8 | 146.6 | 151.1 | 151.4 |
| 65°   | 1878.3 | 1456.8 | 267.3 | 128.9 | 125.0 | 144.2 | 163.9 | 162.4 | 149.4 | 153.9 | 154.5 |
| 67.5° | 1698.2 | 1282.3 | 197.9 | 123.0 | 119.7 | 148.1 | 178.8 | 165.9 | 143.9 | 147.1 | 145.1 |
| 70°   | 1372.6 | 1016.6 | 152.7 | 116.2 | 114.4 | 147.6 | 185.5 | 163.7 | 137.8 | 138.5 | 133.2 |
| 72.5° | 946.5  | 693.3  | 124.2 | 110.0 | 106.7 | 134.5 | 180.8 | 158.5 | 132.7 | 126.9 | 119.9 |
| 75°   | 514.7  | 372.1  | 105.6 | 103.6 | 93.1  | 118.1 | 172.1 | 154.8 | 128.1 | 120.5 | 116.5 |
| 77.5° | 202.5  | 154.4  | 91.6  | 94.7  | 81.4  | 104.3 | 162.4 | 147.7 | 121.7 | 111.8 | 109.8 |
| 80°   | 82.7   | 78.8   | 76.0  | 81.9  | 70.0  | 91.3  | 150.7 | 139.4 | 114.1 | 103.7 | 99.7  |
| 82.5° | 46.9   | 49.0   | 59.1  | 64.7  | 56.8  | 84.0  | 145.1 | 132.7 | 105.1 | 92.9  | 88.2  |
| 85°   | 24.0   | 28.7   | 41.2  | 46.4  | 41.8  | 71.5  | 133.7 | 116.1 | 84.3  | 71.1  | 71.5  |
| 87.5° | 11.6   | 16.0   | 26.0  | 29.1  | 27.1  | 51.7  | 99.8  | 84.2  | 65.6  | 52.0  | 50.4  |
| 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)

STREETWORKS

Report Number: SP1-2101-121-4

Luminaire Tested: IFLD-S-SA2B-722-U-T3R

Test Date: 03/03/2021

### Test Information

Test Method: LM-79-08  
 Report Number: SP1-2101-121-4  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1  
 Measurement Geometry:  $4\pi$   
 Issue Date: 03/03/2021  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: STREETWORKS  
 Catalog Number: **IFLD-S-SA2B-722-U-T3R**  
 Description: STREETWORKS INF FLOOD

PROGRAMMED @ 800mA.

### Spectral Parameters

|                           |         |           |      |      |       |
|---------------------------|---------|-----------|------|------|-------|
| CCT (K):                  | 2218    | CRI (Ra): | 72.2 |      |       |
| CIE u':                   | 0.2889  | R1:       | 69.1 | R9:  | -16.8 |
| CIE v':                   | 0.5350  | R2:       | 83.2 | R10: | 61.9  |
| Duv:                      | -0.0005 | R3:       | 95.4 | R11: | 60.1  |
| CIE x:                    | 0.5026  | R4:       | 66.4 | R12: | 51.2  |
| CIE y:                    | 0.4136  | R5:       | 66.2 | R13: | 71.3  |
| CIE z:                    | 0.0839  | R6:       | 76.7 | R14: | 97.1  |
| Peak Wavelength (nm):     | 606     | R7:       | 76.7 |      |       |
| Dominant Wavelength (nm): | 587     | R8:       | 43.9 |      |       |
| Purity:                   | 75.3    |           |      |      |       |
| Rf:                       | 70      |           |      |      |       |
| Rg:                       | 99.3    |           |      |      |       |



### Test Conditions

Stabilization Time: 95M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 25.3/31%  
 Sphere Temperature (°C): 24.8

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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 2200K 4-step quadrangle

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### Photopic Flux vs. Wavelength

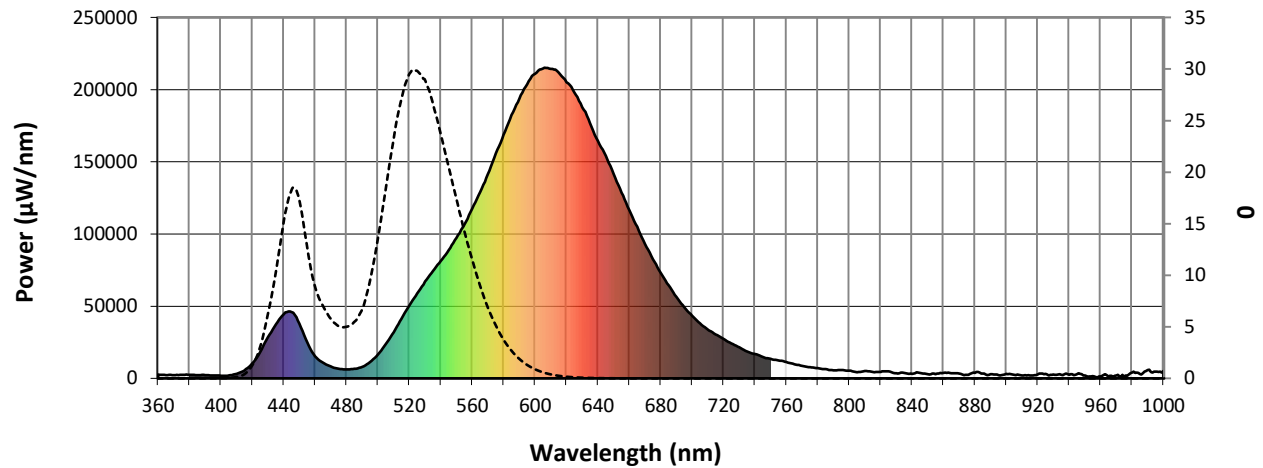


#####

| 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       | 2623             | 0.0              | 490       | 7941             | 1.1              | 620       | 205150           | 53.4             | 750       | 13431            | 0.0              | 880       | 3867             | 0.0              |
| 365       | 2260             | 0.0              | 495       | 11299            | 2.0              | 625       | 198277           | 43.7             | 755       | 12426            | 0.0              | 885       | 3345             | 0.0              |
| 370       | 2306             | 0.0              | 500       | 16633            | 3.7              | 630       | 187878           | 34.0             | 760       | 11385            | 0.0              | 890       | 2956             | 0.0              |
| 375       | 2437             | 0.0              | 505       | 23672            | 6.6              | 635       | 176836           | 26.6             | 765       | 9797             | 0.0              | 895       | 2272             | 0.0              |
| 380       | 2473             | 0.0              | 510       | 32025            | 11.0             | 640       | 164455           | 19.7             | 770       | 8562             | 0.0              | 900       | 3003             | 0.0              |
| 385       | 2203             | 0.0              | 515       | 41295            | 17.1             | 645       | 154086           | 14.8             | 775       | 7810             | 0.0              | 905       | 2480             | 0.0              |
| 390       | 2262             | 0.0              | 520       | 50628            | 24.6             | 650       | 141592           | 10.3             | 780       | 7052             | 0.0              | 910       | 2068             | 0.0              |
| 395       | 2028             | 0.0              | 525       | 58836            | 31.6             | 655       | 128604           | 7.4              | 785       | 6345             | 0.0              | 915       | 2064             | 0.0              |
| 400       | 1806             | 0.0              | 530       | 67109            | 39.5             | 660       | 116713           | 4.9              | 790       | 5524             | 0.0              | 920       | 2581             | 0.0              |
| 405       | 1945             | 0.0              | 535       | 74404            | 46.1             | 665       | 104993           | 3.3              | 795       | 5788             | 0.0              | 925       | 3137             | 0.0              |
| 410       | 3199             | 0.0              | 540       | 81280            | 53.0             | 670       | 93149            | 2.0              | 800       | 5282             | 0.0              | 930       | 2747             | 0.0              |
| 415       | 5572             | 0.0              | 545       | 88806            | 59.1             | 675       | 82543            | 1.4              | 805       | 4258             | 0.0              | 935       | 2471             | 0.0              |
| 420       | 10322            | 0.0              | 550       | 97367            | 66.2             | 680       | 73089            | 0.8              | 810       | 5156             | 0.0              | 940       | 2339             | 0.0              |
| 425       | 18494            | 0.1              | 555       | 106598           | 72.8             | 685       | 64438            | 0.6              | 815       | 4391             | 0.0              | 945       | 2917             | 0.0              |
| 430       | 28541            | 0.2              | 560       | 117615           | 79.9             | 690       | 56546            | 0.3              | 820       | 4383             | 0.0              | 950       | 1966             | 0.0              |
| 435       | 37453            | 0.4              | 565       | 129103           | 85.8             | 695       | 49328            | 0.2              | 825       | 4881             | 0.0              | 955       | 1580             | 0.0              |
| 440       | 44455            | 0.7              | 570       | 141415           | 92.0             | 700       | 43493            | 0.1              | 830       | 3588             | 0.0              | 960       | 1318             | 0.0              |
| 445       | 45934            | 1.0              | 575       | 155854           | 97.0             | 705       | 38035            | 0.1              | 835       | 3835             | 0.0              | 965       | 1419             | 0.0              |
| 450       | 37926            | 1.0              | 580       | 168613           | 100.2            | 710       | 33716            | 0.0              | 840       | 3014             | 0.0              | 970       | 1917             | 0.0              |
| 455       | 24793            | 0.8              | 585       | 182390           | 101.3            | 715       | 30449            | 0.0              | 845       | 3765             | 0.0              | 975       | 1210             | 0.0              |
| 460       | 15340            | 0.6              | 590       | 194054           | 100.3            | 720       | 27240            | 0.0              | 850       | 2906             | 0.0              | 980       | 3915             | 0.0              |
| 465       | 10883            | 0.6              | 595       | 203639           | 96.5             | 725       | 24231            | 0.0              | 855       | 2947             | 0.0              | 985       | 3180             | 0.0              |
| 470       | 8138             | 0.5              | 600       | 211043           | 91.0             | 730       | 21490            | 0.0              | 860       | 3864             | 0.0              | 990       | 5676             | 0.0              |
| 475       | 6653             | 0.5              | 605       | 214591           | 83.1             | 735       | 18548            | 0.0              | 865       | 3546             | 0.0              | 995       | 4736             | 0.0              |
| 480       | 6220             | 0.6              | 610       | 214337           | 73.6             | 740       | 16963            | 0.0              | 870       | 3253             | 0.0              | 1000      | 5113             | 0.0              |
| 485       | 6613             | 0.8              | 615       | 211915           | 64.0             | 745       | 14922            | 0.0              | 875       | 2450             | 0.0              |           |                  |                  |

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### Scotopic Flux vs. Wavelength



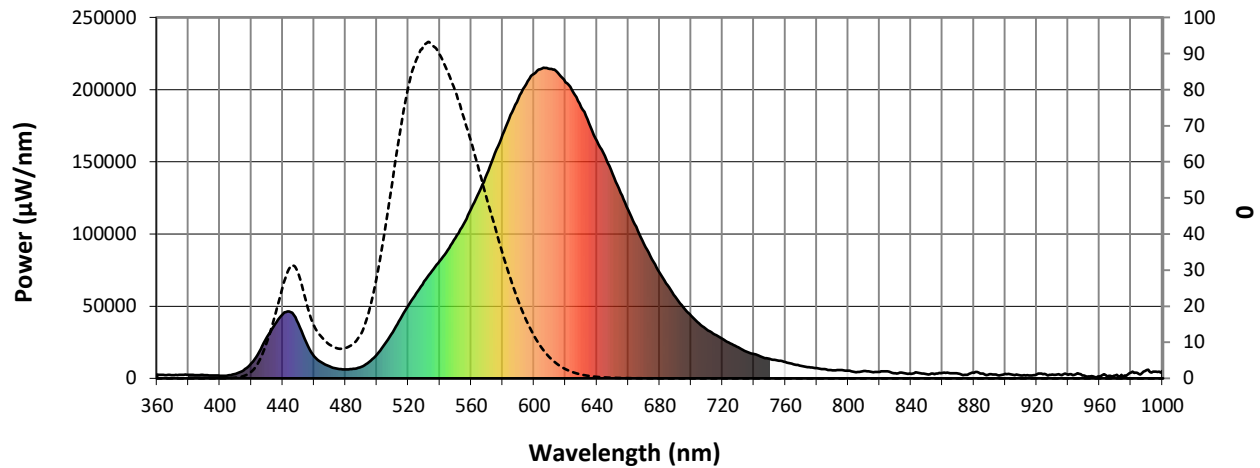
Scotopic Lumens: 7290.1

S/P: 0.84

| 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       | 2623             | 0.0              | 490       | 7941             | 12.2             | 620       | 205150           | 2.6              | 750       | 13431            | 0.0              | 880       | 3867             | 0.0              |
| 365       | 2260             | 0.0              | 495       | 11299            | 18.3             | 625       | 198277           | 1.7              | 755       | 12426            | 0.0              | 885       | 3345             | 0.0              |
| 370       | 2306             | 0.0              | 500       | 16633            | 27.8             | 630       | 187878           | 1.1              | 760       | 11385            | 0.0              | 890       | 2956             | 0.0              |
| 375       | 2437             | 0.0              | 505       | 23672            | 40.2             | 635       | 176836           | 0.7              | 765       | 9797             | 0.0              | 895       | 2272             | 0.0              |
| 380       | 2473             | 0.0              | 510       | 32025            | 54.3             | 640       | 164455           | 0.4              | 770       | 8562             | 0.0              | 900       | 3003             | 0.0              |
| 385       | 2203             | 0.0              | 515       | 41295            | 68.4             | 645       | 154086           | 0.3              | 775       | 7810             | 0.0              | 905       | 2480             | 0.0              |
| 390       | 2262             | 0.0              | 520       | 50628            | 80.5             | 650       | 141592           | 0.2              | 780       | 7052             | 0.0              | 910       | 2068             | 0.0              |
| 395       | 2028             | 0.0              | 525       | 58836            | 88.0             | 655       | 128604           | 0.1              | 785       | 6345             | 0.0              | 915       | 2064             | 0.0              |
| 400       | 1806             | 0.0              | 530       | 67109            | 92.5             | 660       | 116713           | 0.1              | 790       | 5524             | 0.0              | 920       | 2581             | 0.0              |
| 405       | 1945             | 0.1              | 535       | 74404            | 92.7             | 665       | 104993           | 0.0              | 795       | 5788             | 0.0              | 925       | 3137             | 0.0              |
| 410       | 3199             | 0.2              | 540       | 81280            | 89.8             | 670       | 93149            | 0.0              | 800       | 5282             | 0.0              | 930       | 2747             | 0.0              |
| 415       | 5572             | 0.6              | 545       | 88806            | 85.1             | 675       | 82543            | 0.0              | 805       | 4258             | 0.0              | 935       | 2471             | 0.0              |
| 420       | 10322            | 1.7              | 550       | 97367            | 79.6             | 680       | 73089            | 0.0              | 810       | 5156             | 0.0              | 940       | 2339             | 0.0              |
| 425       | 18494            | 4.5              | 555       | 106598           | 72.8             | 685       | 64438            | 0.0              | 815       | 4391             | 0.0              | 945       | 2917             | 0.0              |
| 430       | 28541            | 9.7              | 560       | 117615           | 65.7             | 690       | 56546            | 0.0              | 820       | 4383             | 0.0              | 950       | 1966             | 0.0              |
| 435       | 37453            | 16.7             | 565       | 129103           | 57.9             | 695       | 49328            | 0.0              | 825       | 4881             | 0.0              | 955       | 1580             | 0.0              |
| 440       | 44455            | 24.8             | 570       | 141415           | 49.9             | 700       | 43493            | 0.0              | 830       | 3588             | 0.0              | 960       | 1318             | 0.0              |
| 445       | 45934            | 30.8             | 575       | 155854           | 42.4             | 705       | 38035            | 0.0              | 835       | 3835             | 0.0              | 965       | 1419             | 0.0              |
| 450       | 37926            | 29.4             | 580       | 168613           | 34.7             | 710       | 33716            | 0.0              | 840       | 3014             | 0.0              | 970       | 1917             | 0.0              |
| 455       | 24793            | 21.7             | 585       | 182390           | 27.9             | 715       | 30449            | 0.0              | 845       | 3765             | 0.0              | 975       | 1210             | 0.0              |
| 460       | 15340            | 14.8             | 590       | 194054           | 21.6             | 720       | 27240            | 0.0              | 850       | 2906             | 0.0              | 980       | 3915             | 0.0              |
| 465       | 10883            | 11.5             | 595       | 203639           | 16.2             | 725       | 24231            | 0.0              | 855       | 2947             | 0.0              | 985       | 3180             | 0.0              |
| 470       | 8138             | 9.4              | 600       | 211043           | 11.9             | 730       | 21490            | 0.0              | 860       | 3864             | 0.0              | 990       | 5676             | 0.0              |
| 475       | 6653             | 8.3              | 605       | 214591           | 8.4              | 735       | 18548            | 0.0              | 865       | 3546             | 0.0              | 995       | 4736             | 0.0              |
| 480       | 6220             | 8.4              | 610       | 214337           | 5.8              | 740       | 16963            | 0.0              | 870       | 3253             | 0.0              | 1000      | 5113             | 0.0              |
| 485       | 6613             | 9.6              | 615       | 211915           | 3.9              | 745       | 14922            | 0.0              | 875       | 2450             | 0.0              |           |                  |                  |

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### Melanopic Flux vs. Wavelength



**Melanopic Lumens: 2276.7**

**M/P: 0.26**

| 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       | 2623             | 0.0              | 490       | 7941             | 6.6              | 620       | 205150           | 0.2              | 750       | 13431            | 0.0              | 880       | 3867             | 0.0              |
| 365       | 2260             | 0.0              | 495       | 11299            | 9.3              | 625       | 198277           | 0.1              | 755       | 12426            | 0.0              | 885       | 3345             | 0.0              |
| 370       | 2306             | 0.0              | 500       | 16633            | 13.4             | 630       | 187878           | 0.1              | 760       | 11385            | 0.0              | 890       | 2956             | 0.0              |
| 375       | 2437             | 0.0              | 505       | 23672            | 18.2             | 635       | 176836           | 0.0              | 765       | 9797             | 0.0              | 895       | 2272             | 0.0              |
| 380       | 2473             | 0.0              | 510       | 32025            | 23.0             | 640       | 164455           | 0.0              | 770       | 8562             | 0.0              | 900       | 3003             | 0.0              |
| 385       | 2203             | 0.0              | 515       | 41295            | 27.0             | 645       | 154086           | 0.0              | 775       | 7810             | 0.0              | 905       | 2480             | 0.0              |
| 390       | 2262             | 0.0              | 520       | 50628            | 29.5             | 650       | 141592           | 0.0              | 780       | 7052             | 0.0              | 910       | 2068             | 0.0              |
| 395       | 2028             | 0.0              | 525       | 58836            | 29.8             | 655       | 128604           | 0.0              | 785       | 6345             | 0.0              | 915       | 2064             | 0.0              |
| 400       | 1806             | 0.0              | 530       | 67109            | 29.0             | 660       | 116713           | 0.0              | 790       | 5524             | 0.0              | 920       | 2581             | 0.0              |
| 405       | 1945             | 0.0              | 535       | 74404            | 26.8             | 665       | 104993           | 0.0              | 795       | 5788             | 0.0              | 925       | 3137             | 0.0              |
| 410       | 3199             | 0.1              | 540       | 81280            | 23.8             | 670       | 93149            | 0.0              | 800       | 5282             | 0.0              | 930       | 2747             | 0.0              |
| 415       | 5572             | 0.4              | 545       | 88806            | 20.6             | 675       | 82543            | 0.0              | 805       | 4258             | 0.0              | 935       | 2471             | 0.0              |
| 420       | 10322            | 1.2              | 550       | 97367            | 17.5             | 680       | 73089            | 0.0              | 810       | 5156             | 0.0              | 940       | 2339             | 0.0              |
| 425       | 18494            | 2.9              | 555       | 106598           | 14.4             | 685       | 64438            | 0.0              | 815       | 4391             | 0.0              | 945       | 2917             | 0.0              |
| 430       | 28541            | 6.0              | 560       | 117615           | 11.6             | 690       | 56546            | 0.0              | 820       | 4383             | 0.0              | 950       | 1966             | 0.0              |
| 435       | 37453            | 10.0             | 565       | 129103           | 9.1              | 695       | 49328            | 0.0              | 825       | 4881             | 0.0              | 955       | 1580             | 0.0              |
| 440       | 44455            | 14.9             | 570       | 141415           | 6.9              | 700       | 43493            | 0.0              | 830       | 3588             | 0.0              | 960       | 1318             | 0.0              |
| 445       | 45934            | 18.1             | 575       | 155854           | 5.2              | 705       | 38035            | 0.0              | 835       | 3835             | 0.0              | 965       | 1419             | 0.0              |
| 450       | 37926            | 17.5             | 580       | 168613           | 3.8              | 710       | 33716            | 0.0              | 840       | 3014             | 0.0              | 970       | 1917             | 0.0              |
| 455       | 24793            | 13.0             | 585       | 182390           | 2.7              | 715       | 30449            | 0.0              | 845       | 3765             | 0.0              | 975       | 1210             | 0.0              |
| 460       | 15340            | 9.0              | 590       | 194054           | 1.9              | 720       | 27240            | 0.0              | 850       | 2906             | 0.0              | 980       | 3915             | 0.0              |
| 465       | 10883            | 7.1              | 595       | 203639           | 1.3              | 725       | 24231            | 0.0              | 855       | 2947             | 0.0              | 985       | 3180             | 0.0              |
| 470       | 8138             | 5.8              | 600       | 211043           | 0.9              | 730       | 21490            | 0.0              | 860       | 3864             | 0.0              | 990       | 5676             | 0.0              |
| 475       | 6653             | 5.1              | 605       | 214591           | 0.6              | 735       | 18548            | 0.0              | 865       | 3546             | 0.0              | 995       | 4736             | 0.0              |
| 480       | 6220             | 5.0              | 610       | 214337           | 0.4              | 740       | 16963            | 0.0              | 870       | 3253             | 0.0              | 1000      | 5113             | 0.0              |
| 485       | 6613             | 5.5              | 615       | 211915           | 0.3              | 745       | 14922            | 0.0              | 875       | 2450             | 0.0              |           |                  |                  |

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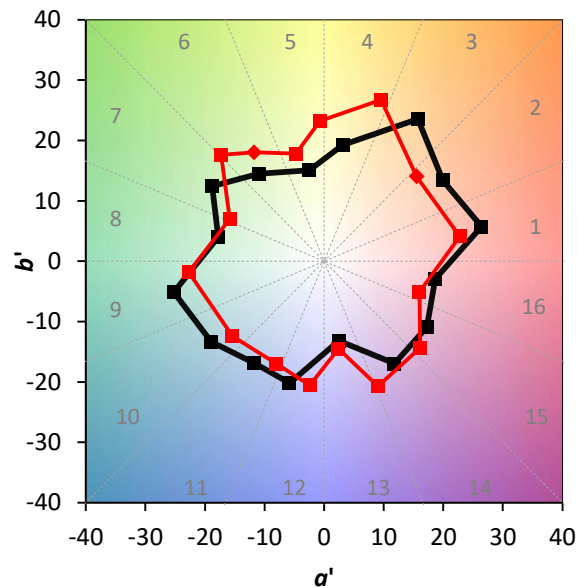
TM-30-18

### Summary

$R_f = 70$   
 $R_g = 99.3$   
 CIE  $R_a = 72.2$   
 $R_g = -16.8$



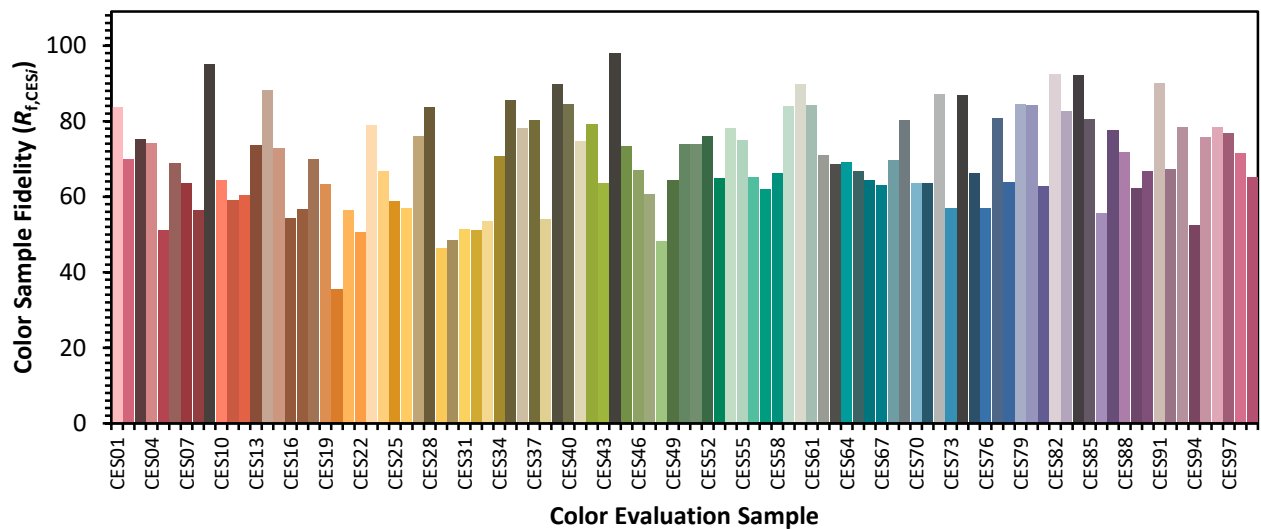
### Color Vector Graphics





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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 87 | CES26 = 57 | CES51 = 74 | CES76 = 57 |
| CES02 = 65 | CES27 = 76 | CES52 = 76 | CES77 = 81 |
| CES03 = 32 | CES28 = 84 | CES53 = 65 | CES78 = 64 |
| CES04 = 72 | CES29 = 46 | CES54 = 78 | CES79 = 85 |
| CES05 = 52 | CES30 = 48 | CES55 = 75 | CES80 = 84 |
| CES06 = 52 | CES31 = 52 | CES56 = 65 | CES81 = 63 |
| CES07 = 44 | CES32 = 51 | CES57 = 62 | CES82 = 92 |
| CES08 = 43 | CES33 = 54 | CES58 = 66 | CES83 = 83 |
| CES09 = 29 | CES34 = 71 | CES59 = 84 | CES84 = 92 |
| CES10 = 79 | CES35 = 86 | CES60 = 90 | CES85 = 81 |
| CES11 = 62 | CES36 = 78 | CES61 = 84 | CES86 = 56 |
| CES12 = 68 | CES37 = 80 | CES62 = 71 | CES87 = 78 |
| CES13 = 45 | CES38 = 54 | CES63 = 68 | CES88 = 72 |
| CES14 = 75 | CES39 = 90 | CES64 = 69 | CES89 = 62 |
| CES15 = 72 | CES40 = 85 | CES65 = 67 | CES90 = 67 |
| CES16 = 49 | CES41 = 75 | CES66 = 64 | CES91 = 90 |
| CES17 = 51 | CES42 = 79 | CES67 = 63 | CES92 = 67 |
| CES18 = 57 | CES43 = 64 | CES68 = 70 | CES93 = 78 |
| CES19 = 74 | CES44 = 98 | CES69 = 80 | CES94 = 52 |
| CES20 = 68 | CES45 = 73 | CES70 = 64 | CES95 = 76 |
| CES21 = 89 | CES46 = 67 | CES71 = 64 | CES96 = 78 |
| CES22 = 81 | CES47 = 61 | CES72 = 87 | CES97 = 77 |
| CES23 = 92 | CES48 = 48 | CES73 = 57 | CES98 = 72 |
| CES24 = 92 | CES49 = 64 | CES74 = 87 | CES99 = 65 |
| CES25 = 74 | CES50 = 74 | CES75 = 66 |            |



Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)