

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: STREETWORKS

Report Number: P870481

Luminaire Tested: **MEM2-HSN-SA-30-830-U-T4W-HSS**

Issue Date: 09/05/2024

**Test Information**

Test Method: LM-79-08  
Report Number: P870481  
Test Lab: INNOVATION CENTER(G3)  
Issue Date: 09/05/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: STREETWORKS  
Catalog Number: MEM2-HSN-SA-30-830-U-T4W-HSS  
Description: EPIC MODERN SHORT HOUSING DISCRETE LED ARRAYS 30W 80CRI 3000K  
FIXTURE w/ TYPE IV WIDE DISTRIBUTION OPTIC AND HOUSE SIDE SHIELD  
Light Source: (10) 3000K CCT, 80 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

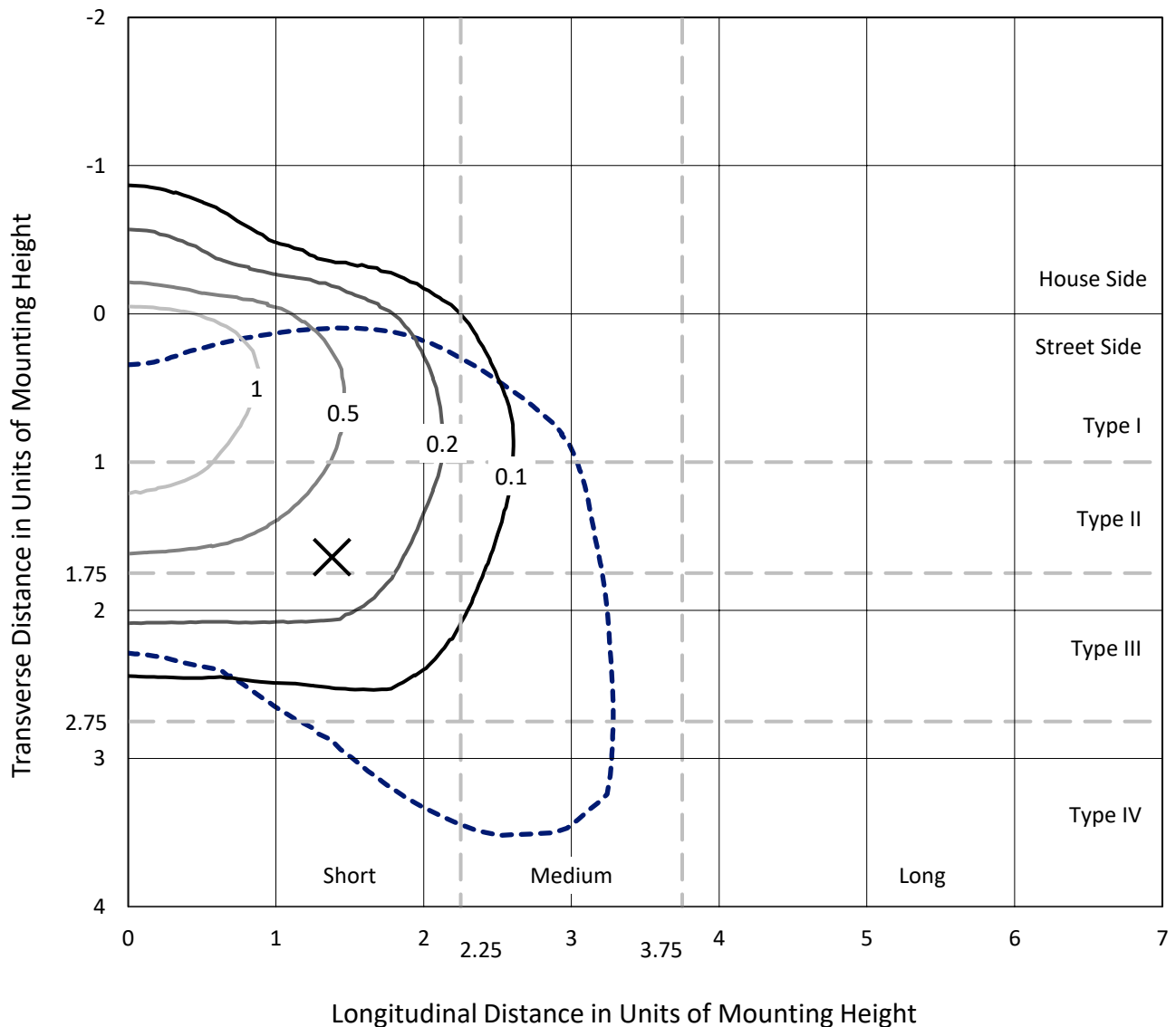
Lumens per Lamp: N/A  
Luminaire Lumens: 3061.8 lumens  
Efficiency: N/A  
Efficacy: 93.3 lumens/watt  
Luminous Opening: Rectangular (W 0.33' x L: 0.33' x H: 0')  
IES Classification: Type IV - Short  
BUG Rating: B0 - U0 - G1

Input Watts (W): 32.8  
Input Voltage (V): 120  
Input Current (A<sub>in</sub>): NR  
Voltage Rise (V): NR  
Power Factor: 0.99  
Total Harmonic Distortion (THDi): 9.76%  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

REPORT NUMBER: P870481  
 CATALOG NUMBER: MEM2-HSN-SA-30-830-U-T4W-HSS

### Iso-Footcandle Lines of Horizontal Illumination

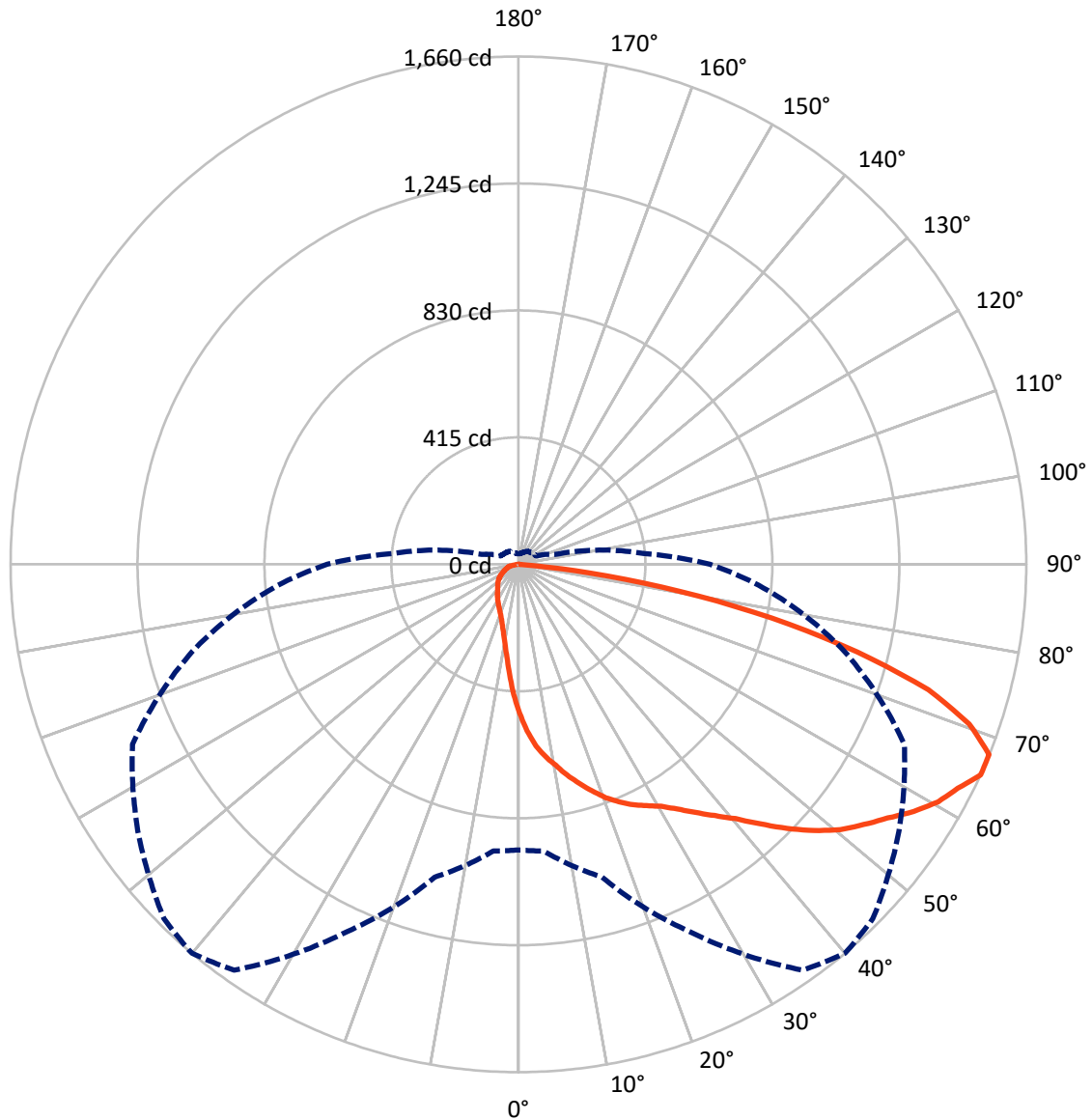
× Max cd  
 - - - 1/2 Max cd



Based on 20 foot mounting height. Maximum calculated value = 1.8 fc  
 Type IV - Short - N/A

REPORT NUMBER: P870481  
CATALOG NUMBER: MEM2-HSN-SA-30-830-U-T4W-HSS

### Luminous Intensity Polar Plot



— Vertical Plane Through 40-Deg Lateral      - - - Horizontal Cone Through 65-Deg Vertical

REPORT NUMBER: P870481

CATALOG NUMBER: MEM2-HSN-SA-30-830-U-T4W-HSS

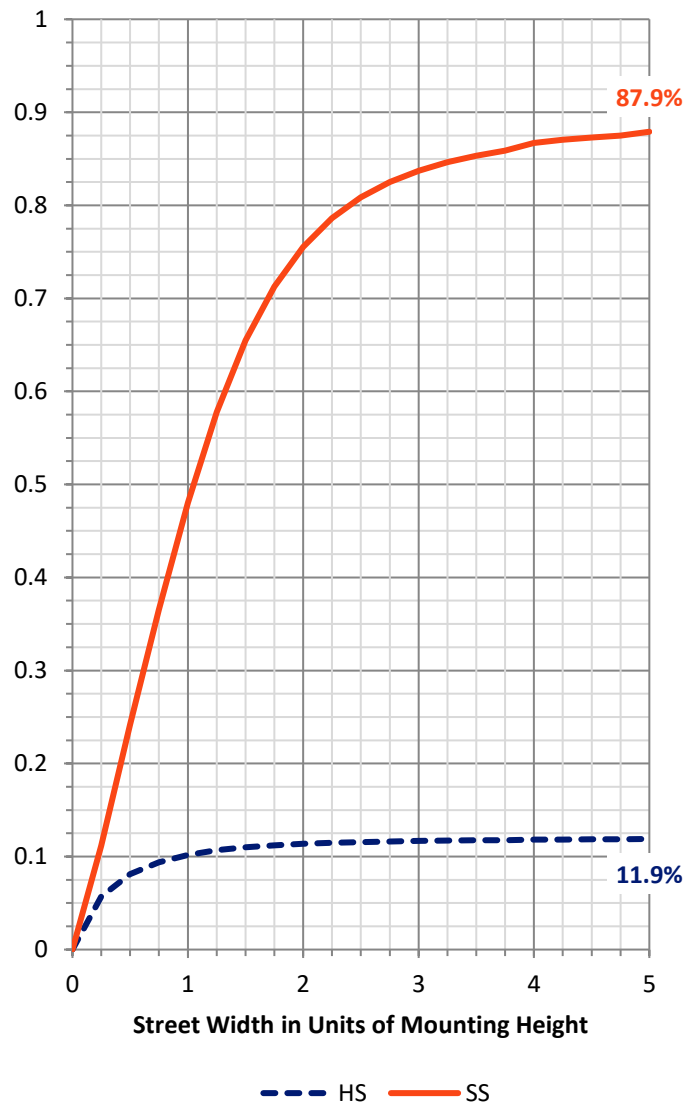
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 366.6    | 0.0    | 366.6  |
|                    | % Fixture | 12.0     | 0.0    | 12.0   |
| <b>Street Side</b> | Lumens    | 2695.2   | 0.0    | 2695.2 |
|                    | % Fixture | 88.0     | 0.0    | 88.0   |
| <b>Total</b>       | Lumens    | 3061.8   | 0.0    | 3061.8 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**Coefficient of Utilization**

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 45.6   | 1.5       |
| 10°-20°   | 137.0  | 4.5       |
| 20°-30°   | 235.6  | 7.7       |
| 30°-40°   | 356.2  | 11.6      |
| 40°-50°   | 520.9  | 17.0      |
| 50°-60°   | 665.3  | 21.7      |
| 60°-70°   | 663.9  | 21.7      |
| 70°-80°   | 389.3  | 12.7      |
| 80°-90°   | 48.0   | 1.6       |
| 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°    | 3061.8 | 100.0     |
| 0°-180°   | 3061.8 | 100.0     |



REPORT NUMBER: P870481

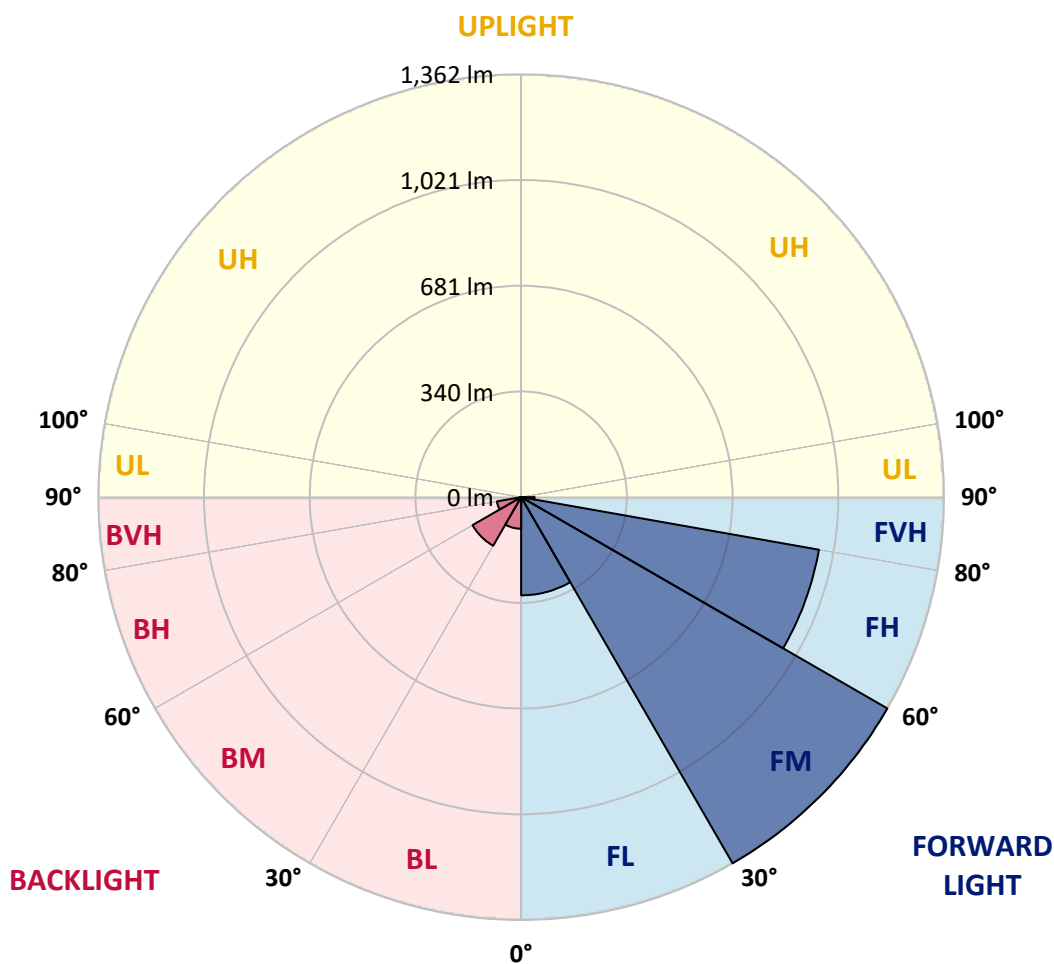
CATALOG NUMBER: MEM2-HSN-SA-30-830-U-T4W-HSS

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

| Zone           | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|----------------|--------|-----------|-------------------------|------|---------|
|                |        |           | B                       | U    | G       |
| FL (0°-30°)    | 316.2  | 10.3      |                         |      |         |
| FM (30°-60°)   | 1361.7 | 44.5      |                         |      |         |
| FH (60°-80°)   | 973.9  | 31.8      |                         |      | G1/1800 |
| FVH (80°-90°)  | 43.3   | 1.4       |                         |      | G1/100  |
| BL (0°-30°)    | 102.0  | 3.3       | B0/110                  |      |         |
| BM (30°-60°)   | 180.6  | 5.9       | B0/220                  |      |         |
| BH (60°-80°)   | 79.4   | 2.6       | B0/110                  |      | G0/110  |
| BVH (80°-90°)  | 4.6    | 0.2       |                         |      | G0/10   |
| UL (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B0-U0-G1**

Type IV Short





REPORT NUMBER: P870481

CATALOG NUMBER: MEM2-HSN-SA-30-830-U-T4W-HSS

**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 40°    | 45°    | 55°    | 65°    | 75°    | 85°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------|
| 0°    | 486.7  | 486.7  | 486.7  | 486.7  | 486.7  | 486.7  | 486.7  | 486.7  | 486.7  | 486.7  | 486.7 |
| 2.5°  | 567.8  | 565.2  | 560.0  | 555.7  | 549.7  | 544.5  | 539.3  | 529.8  | 517.8  | 507.4  | 494.5 |
| 5°    | 623.9  | 619.6  | 616.1  | 611.0  | 600.6  | 596.3  | 592.8  | 573.0  | 552.3  | 530.7  | 502.2 |
| 7.5°  | 663.6  | 667.0  | 660.1  | 652.4  | 639.4  | 634.3  | 629.1  | 609.2  | 583.3  | 552.3  | 511.7 |
| 10°   | 709.3  | 710.2  | 701.6  | 692.1  | 678.3  | 667.9  | 661.0  | 636.8  | 608.4  | 573.9  | 522.1 |
| 12.5° | 753.3  | 753.3  | 748.2  | 734.4  | 716.2  | 706.7  | 694.7  | 667.0  | 632.5  | 592.0  | 534.2 |
| 15°   | 788.7  | 790.4  | 786.1  | 775.8  | 755.9  | 743.0  | 730.9  | 699.0  | 655.0  | 612.7  | 543.6 |
| 17.5° | 820.7  | 819.8  | 817.2  | 807.7  | 788.7  | 778.4  | 766.3  | 730.9  | 680.9  | 629.1  | 558.3 |
| 20°   | 842.2  | 842.2  | 841.4  | 836.2  | 822.4  | 814.6  | 799.9  | 762.8  | 709.3  | 653.2  | 573.9 |
| 22.5° | 858.6  | 857.8  | 857.8  | 858.6  | 850.9  | 843.1  | 837.0  | 799.9  | 738.7  | 674.0  | 589.4 |
| 25°   | 872.4  | 871.6  | 874.2  | 875.9  | 872.4  | 870.7  | 863.8  | 835.3  | 774.9  | 698.1  | 604.9 |
| 27.5° | 890.5  | 893.1  | 892.3  | 892.3  | 891.4  | 893.1  | 892.3  | 868.1  | 810.3  | 724.0  | 621.3 |
| 30°   | 919.0  | 923.3  | 920.8  | 917.3  | 917.3  | 918.2  | 922.5  | 906.9  | 851.7  | 755.9  | 639.4 |
| 32.5° | 985.5  | 981.2  | 963.0  | 951.0  | 952.7  | 953.5  | 957.9  | 949.2  | 893.1  | 792.2  | 658.4 |
| 35°   | 1061.4 | 1056.2 | 1036.4 | 1008.8 | 999.3  | 995.8  | 995.0  | 989.8  | 938.0  | 831.0  | 680.9 |
| 37.5° | 1159.8 | 1161.5 | 1132.2 | 1092.5 | 1064.0 | 1042.4 | 1038.1 | 1026.9 | 976.8  | 866.4  | 704.2 |
| 40°   | 1259.9 | 1253.0 | 1228.0 | 1189.1 | 1133.0 | 1093.3 | 1080.4 | 1064.9 | 1020.9 | 903.5  | 726.6 |
| 42.5° | 1356.5 | 1343.6 | 1310.8 | 1268.5 | 1202.9 | 1159.8 | 1130.4 | 1110.6 | 1061.4 | 944.1  | 748.2 |
| 45°   | 1482.5 | 1445.4 | 1386.7 | 1348.8 | 1266.8 | 1231.4 | 1204.7 | 1160.6 | 1109.7 | 984.6  | 774.1 |
| 47.5° | 1581.8 | 1510.1 | 1456.6 | 1440.2 | 1333.2 | 1300.4 | 1276.3 | 1215.0 | 1158.9 | 1030.3 | 800.8 |
| 50°   | 1563.6 | 1519.6 | 1506.7 | 1492.0 | 1383.3 | 1363.4 | 1341.0 | 1277.1 | 1209.0 | 1078.7 | 826.7 |
| 52.5° | 1517.0 | 1522.2 | 1538.6 | 1513.6 | 1427.3 | 1413.5 | 1398.8 | 1343.6 | 1259.0 | 1118.4 | 850.0 |
| 55°   | 1479.9 | 1490.3 | 1534.3 | 1526.5 | 1479.9 | 1464.4 | 1454.0 | 1409.2 | 1307.3 | 1154.6 | 869.8 |
| 57.5° | 1412.6 | 1404.0 | 1459.2 | 1549.0 | 1536.0 | 1523.9 | 1513.6 | 1478.2 | 1356.5 | 1180.5 | 882.8 |
| 60°   | 1306.5 | 1274.6 | 1348.8 | 1521.4 | 1574.9 | 1576.6 | 1570.5 | 1530.0 | 1396.2 | 1180.5 | 875.9 |
| 62.5° | 1157.2 | 1127.0 | 1218.5 | 1429.0 | 1595.6 | 1612.0 | 1608.5 | 1548.1 | 1413.5 | 1154.6 | 849.1 |
| 65°   | 933.7  | 940.6  | 1058.8 | 1324.6 | 1619.7 | 1660.3 | 1638.7 | 1518.8 | 1391.9 | 1104.6 | 788.7 |
| 67.5° | 745.6  | 766.3  | 872.4  | 1189.1 | 1608.5 | 1659.4 | 1629.2 | 1435.9 | 1299.6 | 1034.7 | 696.4 |
| 70°   | 588.5  | 602.3  | 690.3  | 1006.2 | 1510.1 | 1563.6 | 1525.7 | 1309.1 | 1143.4 | 926.8  | 579.0 |
| 72.5° | 459.9  | 472.9  | 548.0  | 805.1  | 1339.3 | 1401.4 | 1353.9 | 1138.2 | 948.4  | 786.1  | 459.9 |
| 75°   | 349.5  | 359.0  | 415.1  | 620.5  | 1066.6 | 1144.3 | 1109.7 | 911.3  | 740.4  | 622.2  | 352.1 |
| 77.5° | 225.2  | 238.2  | 301.2  | 434.9  | 753.3  | 846.5  | 850.9  | 680.9  | 532.4  | 449.6  | 258.9 |
| 80°   | 149.3  | 154.5  | 193.3  | 283.0  | 463.4  | 535.9  | 560.9  | 459.9  | 340.0  | 286.5  | 186.4 |
| 82.5° | 62.1   | 69.0   | 92.3   | 142.4  | 232.1  | 233.0  | 266.6  | 194.2  | 138.1  | 121.7  | 78.5  |
| 85°   | 1.7    | 3.5    | 2.6    | 6.9    | 6.0    | 9.5    | 11.2   | 15.5   | 11.2   | 12.1   | 12.1  |
| 87.5° | 0.0    | 0.0    | 0.9    | 0.9    | 1.7    | 1.7    | 1.7    | 1.7    | 1.7    | 2.6    | 1.7   |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0   |



REPORT NUMBER: P870481

CATALOG NUMBER: MEM2-HSN-SA-30-830-U-T4W-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°   | 95°   | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 486.7 | 486.7 | 486.7 | 486.7 | 486.7 | 486.7 | 486.7 | 486.7 | 486.7 | 486.7 | 486.7 |
| 2.5°  | 488.4 | 480.7 | 465.1 | 453.0 | 440.1 | 430.6 | 422.0 | 412.5 | 406.4 | 407.3 | 401.3 |
| 5°    | 488.4 | 473.8 | 442.7 | 415.1 | 390.0 | 371.9 | 352.1 | 336.5 | 325.3 | 323.6 | 328.8 |
| 7.5°  | 491.0 | 466.8 | 420.2 | 378.8 | 344.3 | 315.8 | 295.1 | 279.6 | 271.8 | 266.6 | 265.8 |
| 10°   | 493.6 | 461.7 | 399.5 | 346.9 | 303.8 | 272.7 | 254.6 | 237.3 | 228.7 | 227.8 | 225.2 |
| 12.5° | 495.3 | 455.6 | 380.6 | 315.0 | 270.1 | 240.8 | 222.6 | 208.8 | 201.9 | 201.9 | 201.1 |
| 15°   | 501.4 | 453.9 | 360.7 | 290.8 | 244.2 | 215.7 | 200.2 | 189.0 | 184.7 | 182.1 | 181.2 |
| 17.5° | 506.5 | 450.5 | 343.4 | 266.6 | 220.9 | 195.9 | 181.2 | 173.5 | 169.1 | 167.4 | 166.5 |
| 20°   | 514.3 | 448.7 | 327.1 | 246.8 | 203.7 | 179.5 | 168.3 | 161.4 | 158.8 | 157.1 | 157.1 |
| 22.5° | 522.1 | 447.0 | 310.7 | 229.5 | 189.0 | 167.4 | 157.1 | 151.0 | 148.4 | 147.6 | 146.7 |
| 25°   | 531.6 | 446.1 | 296.8 | 214.9 | 176.0 | 157.9 | 148.4 | 143.2 | 139.8 | 138.1 | 138.1 |
| 27.5° | 541.1 | 447.0 | 283.0 | 200.2 | 164.8 | 149.3 | 139.8 | 133.8 | 131.2 | 127.7 | 128.6 |
| 30°   | 554.0 | 447.9 | 271.8 | 188.1 | 155.3 | 140.7 | 132.0 | 124.3 | 120.8 | 119.1 | 119.1 |
| 32.5° | 566.9 | 451.3 | 260.6 | 176.9 | 145.8 | 133.8 | 123.4 | 116.5 | 112.2 | 111.3 | 110.5 |
| 35°   | 580.8 | 453.9 | 250.3 | 167.4 | 138.1 | 126.0 | 115.6 | 108.7 | 105.3 | 104.4 | 104.4 |
| 37.5° | 596.3 | 458.2 | 242.5 | 158.8 | 130.3 | 118.2 | 108.7 | 101.8 | 99.2  | 98.4  | 98.4  |
| 40°   | 612.7 | 465.1 | 236.4 | 151.0 | 124.3 | 111.3 | 102.7 | 96.6  | 94.9  | 94.1  | 94.1  |
| 42.5° | 629.1 | 471.2 | 231.3 | 145.0 | 118.2 | 105.3 | 98.4  | 92.3  | 89.7  | 89.7  | 89.7  |
| 45°   | 644.6 | 475.5 | 226.1 | 138.9 | 112.2 | 101.0 | 93.2  | 88.0  | 85.4  | 85.4  | 85.4  |
| 47.5° | 658.4 | 479.8 | 218.3 | 132.9 | 106.1 | 94.9  | 88.9  | 83.7  | 81.1  | 81.1  | 81.1  |
| 50°   | 673.1 | 482.4 | 209.7 | 125.1 | 100.1 | 90.6  | 84.6  | 78.5  | 76.8  | 75.9  | 75.9  |
| 52.5° | 685.2 | 482.4 | 198.5 | 117.4 | 93.2  | 84.6  | 79.4  | 74.2  | 71.6  | 69.9  | 69.9  |
| 55°   | 693.8 | 482.4 | 186.4 | 107.9 | 86.3  | 79.4  | 74.2  | 69.0  | 65.6  | 63.0  | 63.0  |
| 57.5° | 699.0 | 479.8 | 172.6 | 96.6  | 79.4  | 72.5  | 69.0  | 63.0  | 56.1  | 50.9  | 49.2  |
| 60°   | 694.7 | 472.0 | 157.9 | 84.6  | 71.6  | 66.4  | 63.9  | 56.1  | 46.6  | 44.0  | 44.0  |
| 62.5° | 676.5 | 453.9 | 143.2 | 74.2  | 65.6  | 60.4  | 57.8  | 49.2  | 42.3  | 39.7  | 39.7  |
| 65°   | 625.6 | 409.9 | 125.1 | 64.7  | 58.7  | 55.2  | 51.8  | 44.0  | 38.0  | 34.5  | 34.5  |
| 67.5° | 551.4 | 353.8 | 104.4 | 57.0  | 52.6  | 50.1  | 47.5  | 39.7  | 33.7  | 30.2  | 30.2  |
| 70°   | 447.0 | 285.6 | 88.9  | 50.1  | 46.6  | 44.9  | 42.3  | 36.2  | 29.3  | 26.8  | 26.8  |
| 72.5° | 351.2 | 224.4 | 74.2  | 44.9  | 43.1  | 39.7  | 38.0  | 31.9  | 26.8  | 24.2  | 24.2  |
| 75°   | 261.5 | 167.4 | 65.6  | 39.7  | 39.7  | 35.4  | 34.5  | 28.5  | 23.3  | 21.6  | 21.6  |
| 77.5° | 192.4 | 124.3 | 57.0  | 34.5  | 34.5  | 31.1  | 29.3  | 25.0  | 21.6  | 19.8  | 19.8  |
| 80°   | 130.3 | 84.6  | 42.3  | 25.9  | 25.9  | 25.0  | 23.3  | 21.6  | 18.1  | 16.4  | 15.5  |
| 82.5° | 55.2  | 35.4  | 20.7  | 12.9  | 12.1  | 9.5   | 7.8   | 6.0   | 6.0   | 5.2   | 5.2   |
| 85°   | 9.5   | 4.3   | 4.3   | 3.5   | 2.6   | 2.6   | 2.6   | 1.7   | 1.7   | 1.7   | 1.7   |
| 87.5° | 1.7   | 1.7   | 1.7   | 1.7   | 1.7   | 1.7   | 0.9   | 0.9   | 0.9   | 0.9   | 0.9   |
| 90°   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |



Cooper Lighting Solutions Photometric Lab  
1121 Highway 74 South  
Peachtree City, GA 30269



LM-79-2019: Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Report Prepared for

Cooper Lighting Solutions

Streetworks

Report Number: SP1-2407-157-7

Test Date: 09/05/2024

Luminaire Tested: MEM2-HTN-SA-30-830-U-5WQ

Data in this report applies to families of products including MEM2-HTN-SA-30-830-U-5WQ

**Test Information**

Test Method: LM-79-2019  
 Report Number: SP1-2407-157-7  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry: 4π  
 Issue Date: 09/05/2024  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: Streetworks  
 Catalog Number: **MEM2-HTN-SA-30-830-U-5WQ**  
 Description: Epic Modern Light Square 30W 5WQ Optic

**Spectral Parameters**

CCT (K): 3126  
 CIE u': 0.2465  
 CIE v': 0.5182  
 Duv: -0.0004  
 CIE x: 0.4277  
 CIE y: 0.3997  
 CIE z: 0.1727  
 Peak Wavelength (nm): 601  
 Dominant Wavelength (nm): 582  
 Purity: 48.31913  
 Rf: 84.4  
 Rg: 94.7

|           |      |      |      |
|-----------|------|------|------|
| CRI (Ra): | 82.6 |      |      |
| R1:       | 81.4 | R9:  | 5.1  |
| R2:       | 92.2 | R10: | 82.2 |
| R3:       | 94.9 | R11: | 79.8 |
| R4:       | 80.1 | R12: | 70.4 |
| R5:       | 81.8 | R13: | 84.2 |
| R6:       | 90.5 | R14: | 97.9 |
| R7:       | 81.8 | R15: | 73.6 |
| R8:       | 58.0 |      |      |



**Test Conditions**

Stabilization Time: 22M  
 Operation Time: 1H 22M  
 Sphere Temperature (°C): 24.3

REPORT NUMBER: SP1-2407-157-7

| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | IN0058                | 6/18/2024        | 12/18/2024           |
| Power Meter                    | INXT2011004           | 2/8/2024         | 2/8/2025             |
| AC Power Source                | IN0063                | 10/24/2023       | 10/24/2024           |
| DC Power Source                | IN0208                | 10/24/2023       | 10/24/2024           |
| Sphere Thermometer             | IN0085                | 10/24/2023       | 10/24/2024           |
| Room Thermometer               | IN0046                | 10/24/2023       | 10/24/2024           |

REPORT NUMBER: SP1-2407-157-7

CIE 1931 Chromaticity Diagram



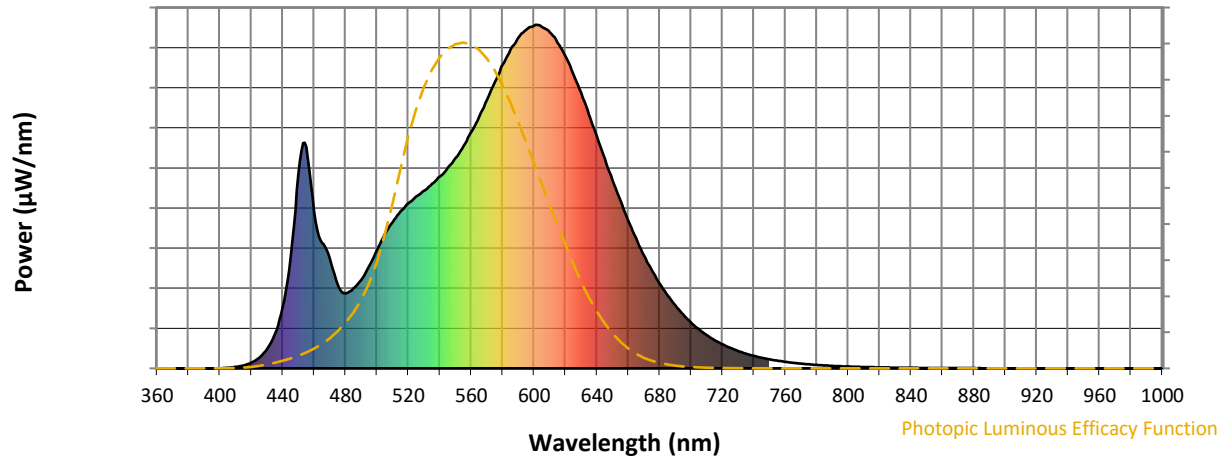
CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles



Point lies inside the ANSI 3000K 4-step quadrangle

REPORT NUMBER: SP1-2407-157-7

**Photopic Flux vs. Wavelength**



**Photopic Lumens: NR**

| λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) |
|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|
| 360    | 0                        | NR            | 490    | 258                      | NR            | 620    | 908                      | NR            | 750    | 26                       | NR            | 880    | 1                        | NR            |
| 365    | 0                        | NR            | 495    | 297                      | NR            | 625    | 857                      | NR            | 755    | 22                       | NR            | 885    | 0                        | NR            |
| 370    | 0                        | NR            | 500    | 345                      | NR            | 630    | 801                      | NR            | 760    | 19                       | NR            | 890    | 0                        | NR            |
| 375    | 0                        | NR            | 505    | 391                      | NR            | 635    | 738                      | NR            | 765    | 16                       | NR            | 895    | 0                        | NR            |
| 380    | 0                        | NR            | 510    | 426                      | NR            | 640    | 675                      | NR            | 770    | 14                       | NR            | 900    | 0                        | NR            |
| 385    | 0                        | NR            | 515    | 456                      | NR            | 645    | 610                      | NR            | 775    | 12                       | NR            | 905    | 0                        | NR            |
| 390    | 0                        | NR            | 520    | 480                      | NR            | 650    | 547                      | NR            | 780    | 10                       | NR            | 910    | 0                        | NR            |
| 395    | 0                        | NR            | 525    | 500                      | NR            | 655    | 488                      | NR            | 785    | 9                        | NR            | 915    | 0                        | NR            |
| 400    | 0                        | NR            | 530    | 517                      | NR            | 660    | 429                      | NR            | 790    | 7                        | NR            | 920    | 0                        | NR            |
| 405    | 2                        | NR            | 535    | 538                      | NR            | 665    | 378                      | NR            | 795    | 6                        | NR            | 925    | 0                        | NR            |
| 410    | 4                        | NR            | 540    | 558                      | NR            | 670    | 328                      | NR            | 800    | 5                        | NR            | 930    | 0                        | NR            |
| 415    | 9                        | NR            | 545    | 584                      | NR            | 675    | 285                      | NR            | 805    | 5                        | NR            | 935    | 0                        | NR            |
| 420    | 16                       | NR            | 550    | 611                      | NR            | 680    | 247                      | NR            | 810    | 4                        | NR            | 940    | 0                        | NR            |
| 425    | 31                       | NR            | 555    | 646                      | NR            | 685    | 212                      | NR            | 815    | 3                        | NR            | 945    | 0                        | NR            |
| 430    | 56                       | NR            | 560    | 687                      | NR            | 690    | 183                      | NR            | 820    | 3                        | NR            | 950    | 0                        | NR            |
| 435    | 101                      | NR            | 565    | 731                      | NR            | 695    | 156                      | NR            | 825    | 3                        | NR            | 955    | 0                        | NR            |
| 440    | 178                      | NR            | 570    | 780                      | NR            | 700    | 133                      | NR            | 830    | 2                        | NR            | 960    | 0                        | NR            |
| 445    | 323                      | NR            | 575    | 832                      | NR            | 705    | 114                      | NR            | 835    | 2                        | NR            | 965    | 0                        | NR            |
| 450    | 566                      | NR            | 580    | 883                      | NR            | 710    | 96                       | NR            | 840    | 2                        | NR            | 970    | 0                        | NR            |
| 455    | 645                      | NR            | 585    | 927                      | NR            | 715    | 82                       | NR            | 845    | 1                        | NR            | 975    | 0                        | NR            |
| 460    | 457                      | NR            | 590    | 963                      | NR            | 720    | 70                       | NR            | 850    | 1                        | NR            | 980    | 0                        | NR            |
| 465    | 365                      | NR            | 595    | 985                      | NR            | 725    | 59                       | NR            | 855    | 1                        | NR            | 985    | 0                        | NR            |
| 470    | 317                      | NR            | 600    | 998                      | NR            | 730    | 50                       | NR            | 860    | 1                        | NR            | 990    | 0                        | NR            |
| 475    | 244                      | NR            | 605    | 994                      | NR            | 735    | 43                       | NR            | 865    | 1                        | NR            | 995    | 0                        | NR            |
| 480    | 218                      | NR            | 610    | 978                      | NR            | 740    | 36                       | NR            | 870    | 1                        | NR            | 1000   | 0                        | NR            |
| 485    | 233                      | NR            | 615    | 947                      | NR            | 745    | 31                       | NR            | 875    | 1                        | NR            |        |                          |               |

REPORT NUMBER: SP1-2407-157-7

Scotopic Flux vs. Wavelength



Scotopic Lumens: NR S/P: 1.42

| λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) |
|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|
| 360    | 0                        | NR            | 490    | 258                      | NR            | 620    | 908                      | NR            | 750    | 26                       | NR            | 880    | 1                        | NR            |
| 365    | 0                        | NR            | 495    | 297                      | NR            | 625    | 857                      | NR            | 755    | 22                       | NR            | 885    | 0                        | NR            |
| 370    | 0                        | NR            | 500    | 345                      | NR            | 630    | 801                      | NR            | 760    | 19                       | NR            | 890    | 0                        | NR            |
| 375    | 0                        | NR            | 505    | 391                      | NR            | 635    | 738                      | NR            | 765    | 16                       | NR            | 895    | 0                        | NR            |
| 380    | 0                        | NR            | 510    | 426                      | NR            | 640    | 675                      | NR            | 770    | 14                       | NR            | 900    | 0                        | NR            |
| 385    | 0                        | NR            | 515    | 456                      | NR            | 645    | 610                      | NR            | 775    | 12                       | NR            | 905    | 0                        | NR            |
| 390    | 0                        | NR            | 520    | 480                      | NR            | 650    | 547                      | NR            | 780    | 10                       | NR            | 910    | 0                        | NR            |
| 395    | 0                        | NR            | 525    | 500                      | NR            | 655    | 488                      | NR            | 785    | 9                        | NR            | 915    | 0                        | NR            |
| 400    | 0                        | NR            | 530    | 517                      | NR            | 660    | 429                      | NR            | 790    | 7                        | NR            | 920    | 0                        | NR            |
| 405    | 2                        | NR            | 535    | 538                      | NR            | 665    | 378                      | NR            | 795    | 6                        | NR            | 925    | 0                        | NR            |
| 410    | 4                        | NR            | 540    | 558                      | NR            | 670    | 328                      | NR            | 800    | 5                        | NR            | 930    | 0                        | NR            |
| 415    | 9                        | NR            | 545    | 584                      | NR            | 675    | 285                      | NR            | 805    | 5                        | NR            | 935    | 0                        | NR            |
| 420    | 16                       | NR            | 550    | 611                      | NR            | 680    | 247                      | NR            | 810    | 4                        | NR            | 940    | 0                        | NR            |
| 425    | 31                       | NR            | 555    | 646                      | NR            | 685    | 212                      | NR            | 815    | 3                        | NR            | 945    | 0                        | NR            |
| 430    | 56                       | NR            | 560    | 687                      | NR            | 690    | 183                      | NR            | 820    | 3                        | NR            | 950    | 0                        | NR            |
| 435    | 101                      | NR            | 565    | 731                      | NR            | 695    | 156                      | NR            | 825    | 3                        | NR            | 955    | 0                        | NR            |
| 440    | 178                      | NR            | 570    | 780                      | NR            | 700    | 133                      | NR            | 830    | 2                        | NR            | 960    | 0                        | NR            |
| 445    | 323                      | NR            | 575    | 832                      | NR            | 705    | 114                      | NR            | 835    | 2                        | NR            | 965    | 0                        | NR            |
| 450    | 566                      | NR            | 580    | 883                      | NR            | 710    | 96                       | NR            | 840    | 2                        | NR            | 970    | 0                        | NR            |
| 455    | 645                      | NR            | 585    | 927                      | NR            | 715    | 82                       | NR            | 845    | 1                        | NR            | 975    | 0                        | NR            |
| 460    | 457                      | NR            | 590    | 963                      | NR            | 720    | 70                       | NR            | 850    | 1                        | NR            | 980    | 0                        | NR            |
| 465    | 365                      | NR            | 595    | 985                      | NR            | 725    | 59                       | NR            | 855    | 1                        | NR            | 985    | 0                        | NR            |
| 470    | 317                      | NR            | 600    | 998                      | NR            | 730    | 50                       | NR            | 860    | 1                        | NR            | 990    | 0                        | NR            |
| 475    | 244                      | NR            | 605    | 994                      | NR            | 735    | 43                       | NR            | 865    | 1                        | NR            | 995    | 0                        | NR            |
| 480    | 218                      | NR            | 610    | 978                      | NR            | 740    | 36                       | NR            | 870    | 1                        | NR            | 1000   | 0                        | NR            |
| 485    | 233                      | NR            | 615    | 947                      | NR            | 745    | 31                       | NR            | 875    | 1                        | NR            |        |                          |               |

REPORT NUMBER: SP1-2407-157-7

Melanopic Flux vs. Wavelength



Melanopic Lumens: NR

M/P: 2.79

| λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) |
|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|
| 360    | 0                        | NR            | 490    | 258                      | NR            | 620    | 908                      | NR            | 750    | 26                       | NR            | 880    | 1                        | NR            |
| 365    | 0                        | NR            | 495    | 297                      | NR            | 625    | 857                      | NR            | 755    | 22                       | NR            | 885    | 0                        | NR            |
| 370    | 0                        | NR            | 500    | 345                      | NR            | 630    | 801                      | NR            | 760    | 19                       | NR            | 890    | 0                        | NR            |
| 375    | 0                        | NR            | 505    | 391                      | NR            | 635    | 738                      | NR            | 765    | 16                       | NR            | 895    | 0                        | NR            |
| 380    | 0                        | NR            | 510    | 426                      | NR            | 640    | 675                      | NR            | 770    | 14                       | NR            | 900    | 0                        | NR            |
| 385    | 0                        | NR            | 515    | 456                      | NR            | 645    | 610                      | NR            | 775    | 12                       | NR            | 905    | 0                        | NR            |
| 390    | 0                        | NR            | 520    | 480                      | NR            | 650    | 547                      | NR            | 780    | 10                       | NR            | 910    | 0                        | NR            |
| 395    | 0                        | NR            | 525    | 500                      | NR            | 655    | 488                      | NR            | 785    | 9                        | NR            | 915    | 0                        | NR            |
| 400    | 0                        | NR            | 530    | 517                      | NR            | 660    | 429                      | NR            | 790    | 7                        | NR            | 920    | 0                        | NR            |
| 405    | 2                        | NR            | 535    | 538                      | NR            | 665    | 378                      | NR            | 795    | 6                        | NR            | 925    | 0                        | NR            |
| 410    | 4                        | NR            | 540    | 558                      | NR            | 670    | 328                      | NR            | 800    | 5                        | NR            | 930    | 0                        | NR            |
| 415    | 9                        | NR            | 545    | 584                      | NR            | 675    | 285                      | NR            | 805    | 5                        | NR            | 935    | 0                        | NR            |
| 420    | 16                       | NR            | 550    | 611                      | NR            | 680    | 247                      | NR            | 810    | 4                        | NR            | 940    | 0                        | NR            |
| 425    | 31                       | NR            | 555    | 646                      | NR            | 685    | 212                      | NR            | 815    | 3                        | NR            | 945    | 0                        | NR            |
| 430    | 56                       | NR            | 560    | 687                      | NR            | 690    | 183                      | NR            | 820    | 3                        | NR            | 950    | 0                        | NR            |
| 435    | 101                      | NR            | 565    | 731                      | NR            | 695    | 156                      | NR            | 825    | 3                        | NR            | 955    | 0                        | NR            |
| 440    | 178                      | NR            | 570    | 780                      | NR            | 700    | 133                      | NR            | 830    | 2                        | NR            | 960    | 0                        | NR            |
| 445    | 323                      | NR            | 575    | 832                      | NR            | 705    | 114                      | NR            | 835    | 2                        | NR            | 965    | 0                        | NR            |
| 450    | 566                      | NR            | 580    | 883                      | NR            | 710    | 96                       | NR            | 840    | 2                        | NR            | 970    | 0                        | NR            |
| 455    | 645                      | NR            | 585    | 927                      | NR            | 715    | 82                       | NR            | 845    | 1                        | NR            | 975    | 0                        | NR            |
| 460    | 457                      | NR            | 590    | 963                      | NR            | 720    | 70                       | NR            | 850    | 1                        | NR            | 980    | 0                        | NR            |
| 465    | 365                      | NR            | 595    | 985                      | NR            | 725    | 59                       | NR            | 855    | 1                        | NR            | 985    | 0                        | NR            |
| 470    | 317                      | NR            | 600    | 998                      | NR            | 730    | 50                       | NR            | 860    | 1                        | NR            | 990    | 0                        | NR            |
| 475    | 244                      | NR            | 605    | 994                      | NR            | 735    | 43                       | NR            | 865    | 1                        | NR            | 995    | 0                        | NR            |
| 480    | 218                      | NR            | 610    | 978                      | NR            | 740    | 36                       | NR            | 870    | 1                        | NR            | 1000   | 0                        | NR            |
| 485    | 233                      | NR            | 615    | 947                      | NR            | 745    | 31                       | NR            | 875    | 1                        | NR            |        |                          |               |

**Summary**

$R_f = 84.4$   
 $R_g = 94.7$   
 $CIE R_a = 82.6$   
 $R_9 = 5.1$



**Color Vector Graphics**





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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 86 | CES51 = 93 | CES76 = 82 |
| CES02 = 63 | CES27 = 92 | CES52 = 93 | CES77 = 84 |
| CES03 = 31 | CES28 = 94 | CES53 = 89 | CES78 = 81 |
| CES04 = 70 | CES29 = 92 | CES54 = 89 | CES79 = 90 |
| CES05 = 49 | CES30 = 91 | CES55 = 86 | CES80 = 89 |
| CES06 = 51 | CES31 = 93 | CES56 = 85 | CES81 = 72 |
| CES07 = 42 | CES32 = 85 | CES57 = 83 | CES82 = 95 |
| CES08 = 41 | CES33 = 97 | CES58 = 84 | CES83 = 94 |
| CES09 = 29 | CES34 = 92 | CES59 = 91 | CES84 = 91 |
| CES10 = 76 | CES35 = 96 | CES60 = 90 | CES85 = 74 |
| CES11 = 59 | CES36 = 81 | CES61 = 87 | CES86 = 68 |
| CES12 = 65 | CES37 = 96 | CES62 = 83 | CES87 = 84 |
| CES13 = 43 | CES38 = 86 | CES63 = 87 | CES88 = 88 |
| CES14 = 74 | CES39 = 98 | CES64 = 79 | CES89 = 75 |
| CES15 = 71 | CES40 = 96 | CES65 = 78 | CES90 = 89 |
| CES16 = 47 | CES41 = 96 | CES66 = 77 | CES91 = 73 |
| CES17 = 50 | CES42 = 97 | CES67 = 76 | CES92 = 63 |
| CES18 = 56 | CES43 = 91 | CES68 = 80 | CES93 = 77 |
| CES19 = 72 | CES44 = 99 | CES69 = 85 | CES94 = 61 |
| CES20 = 66 | CES45 = 93 | CES70 = 78 | CES95 = 73 |
| CES21 = 87 | CES46 = 90 | CES71 = 74 | CES96 = 84 |
| CES22 = 79 | CES47 = 94 | CES72 = 91 | CES97 = 88 |
| CES23 = 92 | CES48 = 83 | CES73 = 74 | CES98 = 85 |
| CES24 = 91 | CES49 = 91 | CES74 = 90 | CES99 = 76 |
| CES25 = 72 | CES50 = 93 | CES75 = 78 |            |



Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)