

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: P1388347

Luminaire Tested: **VAL-T-SB4A-722-U-T4W-HSS**

Issue Date: 02/18/2026

This test was performed under the Supervised Manufacturer's Testing Program. The results of this test have not been  
influenced by sources from within Cooper Lighting Solutions or from external interests.

**Test Information**

Test Method: LM-79-08  
Report Number: P1388347  
Test Lab: INNOVATION CENTER(G1)  
Issue Date: 02/18/2026  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: STREETWORKS  
Catalog Number: VAL-T-SB4A-722-U-T4W-HSS  
Description: GALLEON II WALL SLIM HIGH DENSITY LED ARRAYS 45 SQUARE 114W 70CRI  
2200K FIXTURE w/ TYPE IV WIDE DISTRIBUTION OPTIC AND HOUSE SIDE SHIELD  
Light Source: (104) 2200K CCT, 70 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER  
Luminaire Equipment: 

| <u>Sample No.</u> | <u>Condition</u> | <u>Description</u> |
|-------------------|------------------|--------------------|
| a                 | good             | reflector          |
| b                 | good             | lens               |
| c                 | good             | housing            |
| d                 | good             | cord               |

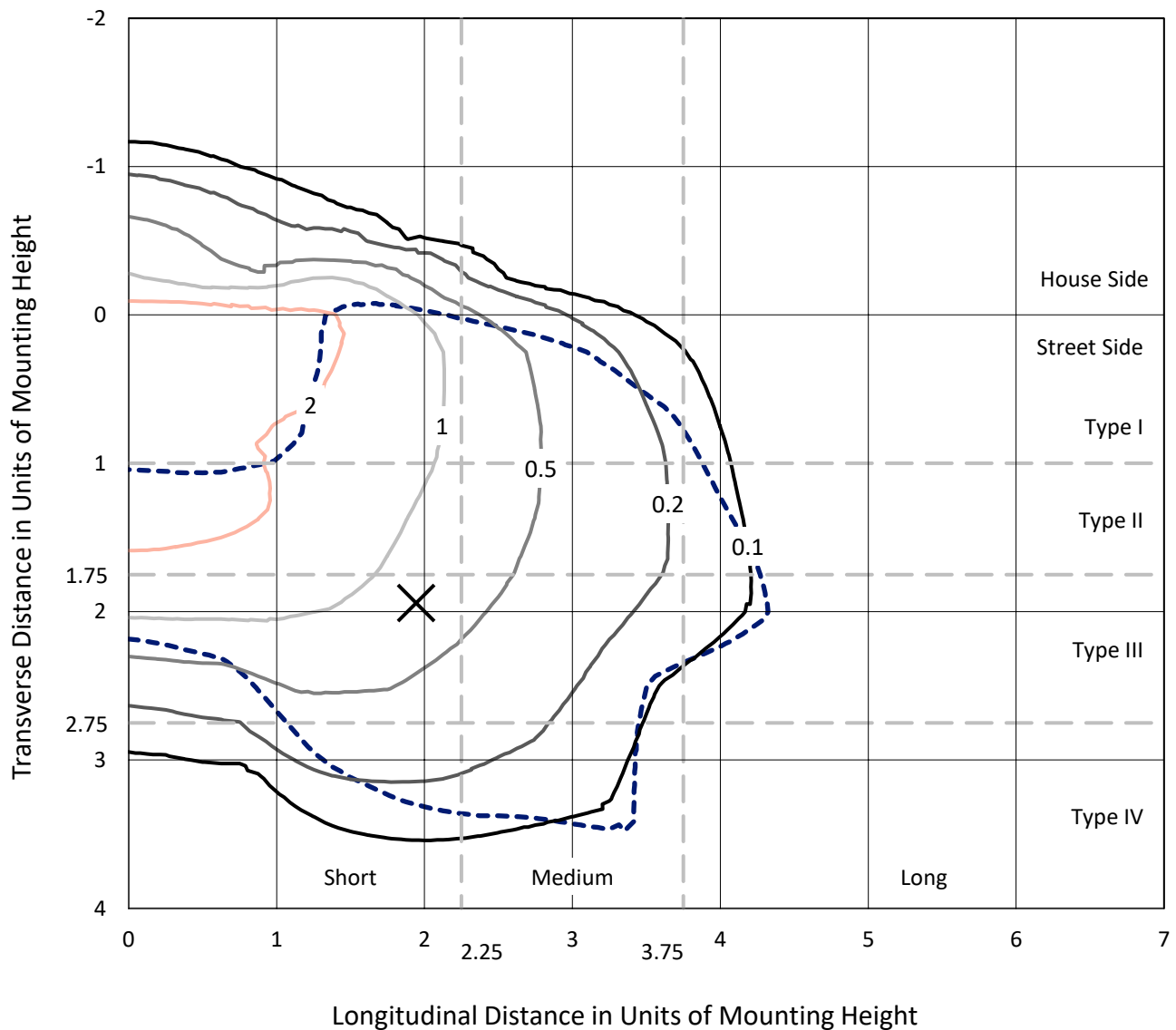
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 10400.7 lumens  
Efficiency: N/A  
Efficacy: 91.2 lumens/watt  
Luminous Opening: Rectangular (W 1.5' x L: 1' x H: 0')  
IES Classification: Type IV - Short  
BUG Rating: B1 - U0 - G2  
  
Input Watts (W): 114  
Input Voltage (V): 120  
Input Current (A<sub>in</sub>): NR  
Voltage Rise (V): NR  
Power Factor: 0.98  
Total Harmonic Distortion (THDi): 8.2%  
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

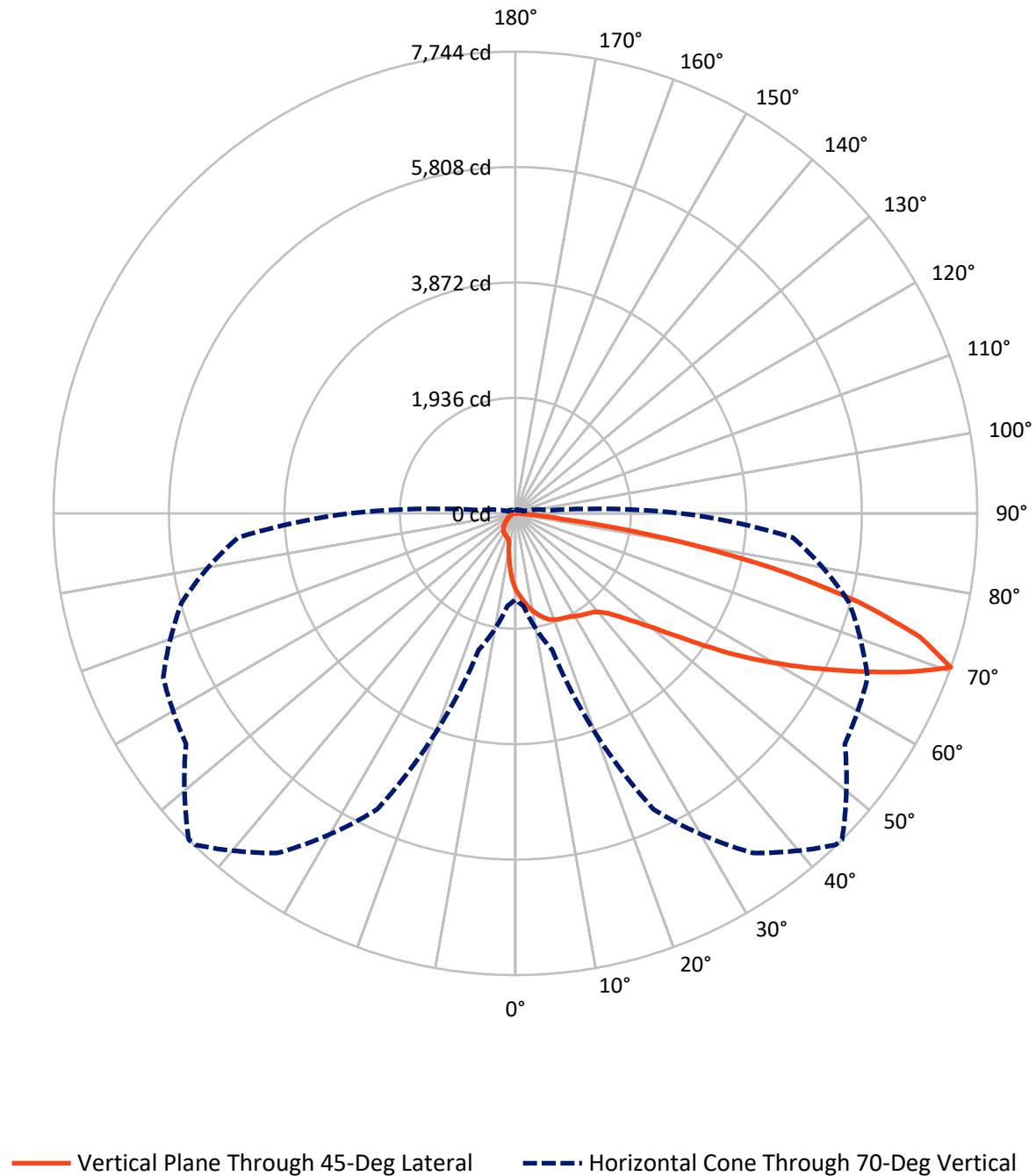
× Max cd  
 --- 1/2 Max cd



Based on 20 foot mounting height. Maximum calculated value = 4.5 fc  
 Type IV - Short - N/A

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## Luminous Intensity Polar Plot



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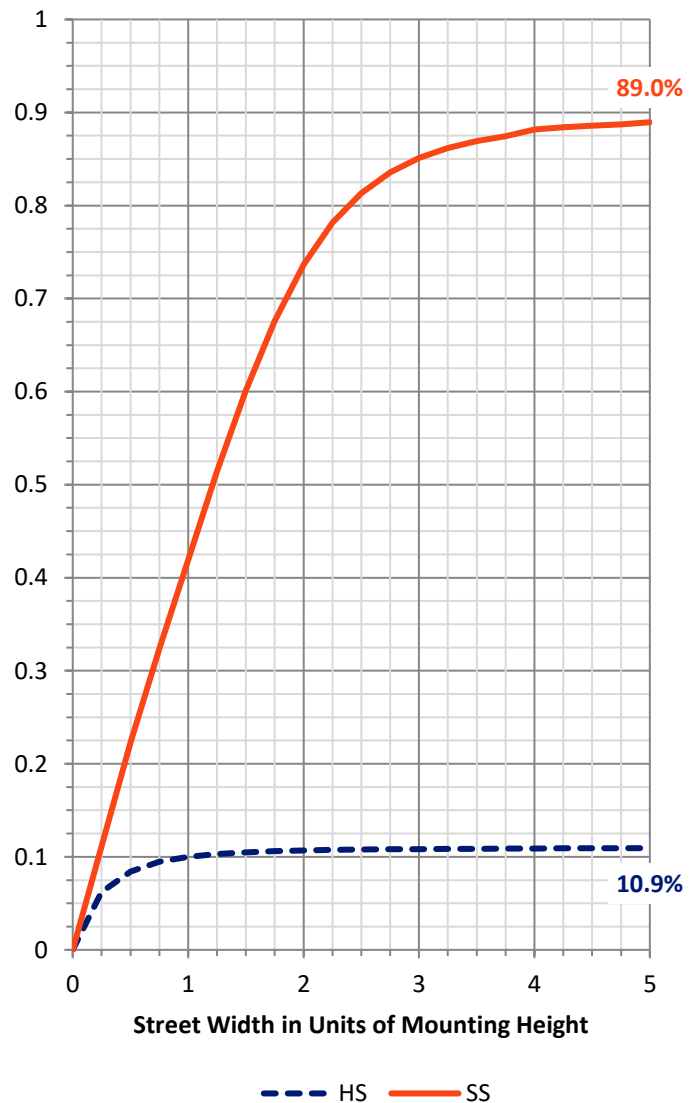
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 1148.6   | 0.0    | 1148.6  |
|                    | % Fixture | 11.0     | 0.0    | 11.0    |
| <b>Street Side</b> | Lumens    | 9252.1   | 0.0    | 9252.1  |
|                    | % Fixture | 89.0     | 0.0    | 89.0    |
| <b>Total</b>       | Lumens    | 10400.7  | 0.0    | 10400.7 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 117.7   | 1.1       |
| 10°-20°   | 347.2   | 3.3       |
| 20°-30°   | 576.4   | 5.5       |
| 30°-40°   | 817.2   | 7.9       |
| 40°-50°   | 1296.0  | 12.5      |
| 50°-60°   | 2282.2  | 21.9      |
| 60°-70°   | 2958.3  | 28.4      |
| 70°-80°   | 1889.6  | 18.2      |
| 80°-90°   | 116.0   | 1.1       |
| 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°    | 10400.7 | 100.0     |
| 0°-180°   | 10400.7 | 100.0     |

**Coefficient of Utilization**



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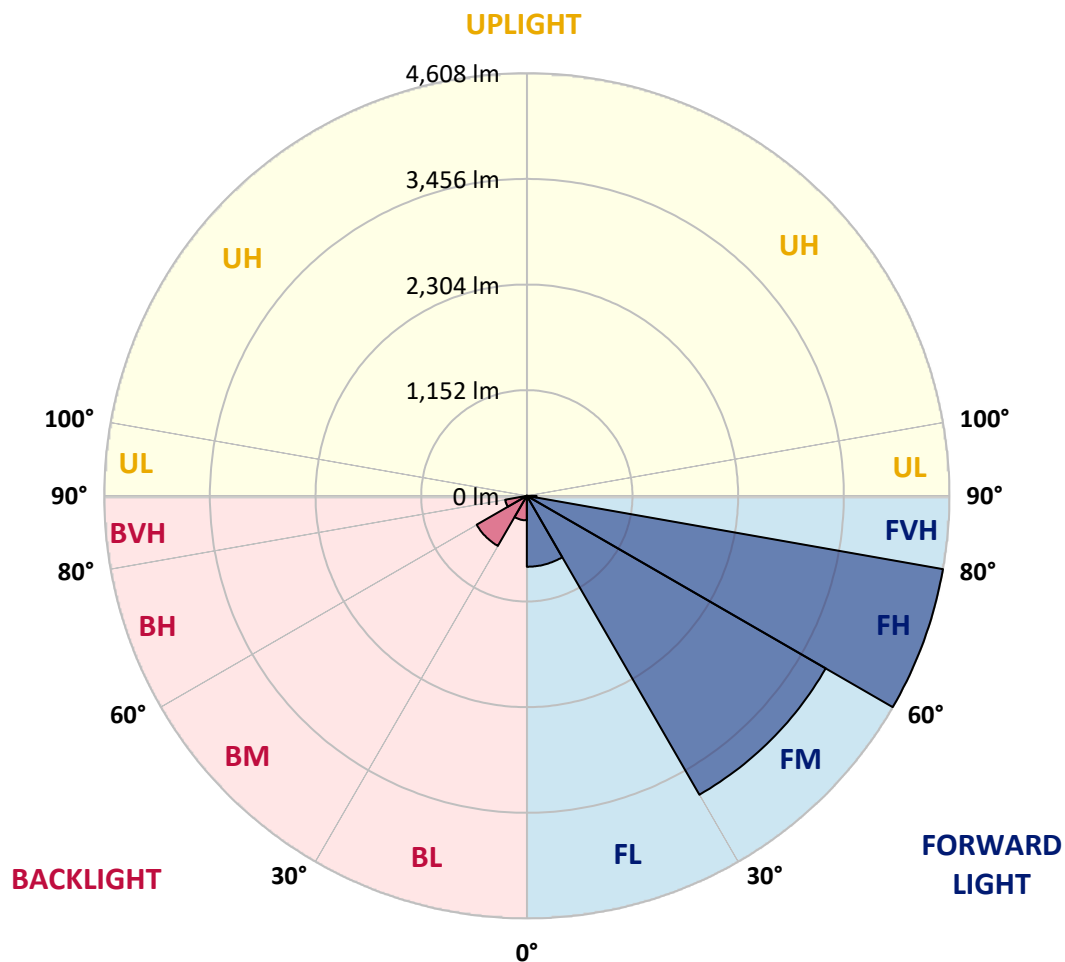
CATALOG NUMBER: VAL-T-SB4A-722-U-T4W-HSS

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 773.8  | 7.4       |                         |      |         |
| FM   | (30°-60°)   | 3764.1 | 36.2      |                         |      |         |
| FH   | (60°-80°)   | 4608.3 | 44.3      |                         |      | G2/5000 |
| FVH  | (80°-90°)   | 105.9  | 1.0       |                         |      | G2/225  |
| BL   | (0°-30°)    | 267.5  | 2.6       | B1/500                  |      |         |
| BM   | (30°-60°)   | 631.2  | 6.1       | B1/1000                 |      |         |
| BH   | (60°-80°)   | 239.6  | 2.3       | B1/500                  |      | G1/500  |
| BVH  | (80°-90°)   | 10.2   | 0.1       |                         |      | G1/100  |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

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

Type IV Short





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CATALOG NUMBER: VAL-T-SB4A-722-U-T4W-HSS

**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 44°    | 45°    | 55°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1285.6 | 1285.6 | 1285.6 | 1285.6 | 1285.6 | 1285.6 | 1285.6 | 1285.6 | 1285.6 | 1285.6 | 1285.6 |
| 2.5°  | 1435.9 | 1435.9 | 1422.6 | 1415.9 | 1405.9 | 1385.8 | 1385.8 | 1372.5 | 1345.7 | 1325.7 | 1302.3 |
| 5°    | 1582.8 | 1576.2 | 1556.1 | 1542.8 | 1516.1 | 1486.0 | 1486.0 | 1449.3 | 1409.2 | 1379.1 | 1329.1 |
| 7.5°  | 1703.1 | 1699.7 | 1686.4 | 1663.0 | 1626.3 | 1589.5 | 1582.8 | 1539.4 | 1482.7 | 1429.2 | 1369.1 |
| 10°   | 1819.9 | 1819.9 | 1789.9 | 1763.2 | 1723.1 | 1676.3 | 1676.3 | 1619.6 | 1552.8 | 1489.3 | 1412.5 |
| 12.5° | 1920.1 | 1906.8 | 1883.4 | 1840.0 | 1799.9 | 1753.1 | 1749.8 | 1693.0 | 1622.9 | 1556.1 | 1466.0 |
| 15°   | 1996.9 | 1990.2 | 1960.2 | 1913.4 | 1866.7 | 1819.9 | 1819.9 | 1759.8 | 1693.0 | 1616.2 | 1519.4 |
| 17.5° | 2050.3 | 2047.0 | 2013.6 | 1960.2 | 1910.1 | 1870.0 | 1873.4 | 1819.9 | 1759.8 | 1679.7 | 1579.5 |
| 20°   | 2063.7 | 2053.7 | 2027.0 | 1976.9 | 1936.8 | 1900.1 | 1903.4 | 1863.3 | 1809.9 | 1746.5 | 1636.3 |
| 22.5° | 2043.7 | 2040.3 | 2010.3 | 1970.2 | 1946.8 | 1920.1 | 1923.5 | 1900.1 | 1866.7 | 1799.9 | 1703.1 |
| 25°   | 2020.3 | 2013.6 | 1993.6 | 1960.2 | 1946.8 | 1933.5 | 1940.1 | 1930.1 | 1916.8 | 1863.3 | 1769.8 |
| 27.5° | 2013.6 | 2006.9 | 1983.6 | 1953.5 | 1953.5 | 1953.5 | 1960.2 | 1973.5 | 1970.2 | 1926.8 | 1836.6 |
| 30°   | 2023.6 | 2027.0 | 2003.6 | 1973.5 | 1966.9 | 1986.9 | 2000.3 | 2030.3 | 2030.3 | 1983.6 | 1910.1 |
| 32.5° | 2053.7 | 2050.3 | 2030.3 | 1990.2 | 1986.9 | 2020.3 | 2033.7 | 2077.1 | 2067.0 | 2030.3 | 1973.5 |
| 35°   | 2113.8 | 2113.8 | 2083.7 | 2023.6 | 2010.3 | 2053.7 | 2067.0 | 2120.5 | 2120.5 | 2087.1 | 2037.0 |
| 37.5° | 2224.0 | 2237.3 | 2200.6 | 2103.8 | 2060.4 | 2083.7 | 2103.8 | 2167.2 | 2190.6 | 2150.5 | 2113.8 |
| 40°   | 2421.0 | 2394.3 | 2357.6 | 2224.0 | 2143.8 | 2163.9 | 2173.9 | 2244.0 | 2277.4 | 2227.3 | 2204.0 |
| 42.5° | 2901.9 | 2871.8 | 2711.5 | 2407.7 | 2280.8 | 2284.1 | 2294.1 | 2360.9 | 2424.4 | 2367.6 | 2347.5 |
| 45°   | 3613.2 | 3586.4 | 3316.0 | 2798.4 | 2484.5 | 2467.8 | 2481.1 | 2537.9 | 2624.7 | 2584.6 | 2564.6 |
| 47.5° | 4157.5 | 4124.1 | 3920.4 | 3372.7 | 2811.7 | 2711.5 | 2721.6 | 2765.0 | 2911.9 | 2878.5 | 2875.2 |
| 50°   | 4421.3 | 4401.2 | 4281.0 | 3990.5 | 3362.7 | 3028.8 | 3025.4 | 3065.5 | 3265.9 | 3262.5 | 3272.5 |
| 52.5° | 4685.1 | 4685.1 | 4591.6 | 4454.7 | 4023.9 | 3466.2 | 3446.2 | 3409.5 | 3683.3 | 3703.3 | 3810.2 |
| 55°   | 4972.3 | 4978.9 | 4975.6 | 4938.9 | 4678.4 | 4037.2 | 3973.8 | 3843.6 | 4167.5 | 4227.6 | 4357.8 |
| 57.5° | 5262.8 | 5276.1 | 5302.9 | 5446.4 | 5373.0 | 4638.3 | 4558.2 | 4317.8 | 4735.2 | 4721.8 | 4805.3 |
| 60°   | 5489.9 | 5503.2 | 5613.4 | 5880.6 | 5940.7 | 5246.1 | 5135.9 | 4862.1 | 5299.5 | 5222.7 | 5169.3 |
| 62.5° | 5352.9 | 5386.3 | 5777.0 | 6241.2 | 6438.2 | 5813.8 | 5743.6 | 5476.5 | 5857.2 | 5613.4 | 5309.5 |
| 65°   | 4074.0 | 4240.9 | 5105.8 | 6311.3 | 6889.0 | 6458.3 | 6398.2 | 6131.0 | 6237.9 | 5673.5 | 5199.3 |
| 67.5° | 2517.9 | 2748.3 | 3686.6 | 5880.6 | 7119.4 | 7159.5 | 7092.7 | 6615.2 | 6267.9 | 5723.6 | 5072.4 |
| 70°   | 1442.6 | 1559.5 | 2367.6 | 5473.2 | 6955.8 | 7730.5 | 7743.9 | 6742.1 | 6515.0 | 5793.7 | 4668.4 |
| 72.5° | 951.7  | 985.1  | 1299.0 | 4578.2 | 6742.1 | 7009.2 | 7086.1 | 7209.6 | 6682.0 | 5473.2 | 3850.2 |
| 75°   | 434.1  | 450.8  | 654.5  | 2928.6 | 5129.2 | 6024.1 | 5950.7 | 6004.1 | 6344.7 | 4781.9 | 2825.1 |
| 77.5° | 136.9  | 156.9  | 263.8  | 1115.3 | 2728.2 | 4454.7 | 4401.2 | 3095.6 | 4701.8 | 2618.0 | 884.9  |
| 80°   | 66.8   | 76.8   | 156.9  | 337.3  | 1008.5 | 2524.5 | 2588.0 | 1055.2 | 1489.3 | 591.1  | 180.3  |
| 82.5° | 30.1   | 33.4   | 90.2   | 160.3  | 394.0  | 741.3  | 788.1  | 344.0  | 387.4  | 183.7  | 66.8   |
| 85°   | 13.4   | 16.7   | 36.7   | 63.4   | 110.2  | 120.2  | 130.2  | 73.5   | 143.6  | 103.5  | 33.4   |
| 87.5° | 0.0    | 3.3    | 3.3    | 10.0   | 10.0   | 13.4   | 13.4   | 16.7   | 20.0   | 23.4   | 20.0   |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |



REPORT NUMBER: P1388347

CATALOG NUMBER: VAL-T-SB4A-722-U-T4W-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1285.6 | 1285.6 | 1285.6 | 1285.6 | 1285.6 | 1285.6 | 1285.6 | 1285.6 | 1285.6 | 1285.6 | 1285.6 |
| 2.5°  | 1289.0 | 1272.3 | 1248.9 | 1215.5 | 1192.1 | 1155.4 | 1128.7 | 1108.7 | 1085.3 | 1092.0 | 1095.3 |
| 5°    | 1299.0 | 1272.3 | 1208.8 | 1128.7 | 1058.6 | 988.4  | 938.4  | 891.6  | 861.5  | 858.2  | 844.8  |
| 7.5°  | 1325.7 | 1279.0 | 1172.1 | 1041.9 | 918.3  | 824.8  | 741.3  | 677.9  | 637.8  | 624.5  | 617.8  |
| 10°   | 1362.4 | 1295.7 | 1128.7 | 945.0  | 781.4  | 654.5  | 557.7  | 507.6  | 487.5  | 484.2  | 484.2  |
| 12.5° | 1402.5 | 1319.0 | 1085.3 | 848.2  | 647.8  | 510.9  | 467.5  | 460.8  | 460.8  | 464.2  | 464.2  |
| 15°   | 1449.3 | 1335.7 | 1035.2 | 734.7  | 517.6  | 450.8  | 447.5  | 447.5  | 447.5  | 454.1  | 450.8  |
| 17.5° | 1496.0 | 1359.1 | 975.1  | 621.1  | 447.5  | 434.1  | 434.1  | 434.1  | 434.1  | 440.8  | 437.5  |
| 20°   | 1546.1 | 1375.8 | 911.6  | 517.6  | 427.4  | 424.1  | 424.1  | 420.8  | 420.8  | 427.4  | 427.4  |
| 22.5° | 1602.9 | 1389.2 | 841.5  | 447.5  | 417.4  | 410.7  | 410.7  | 410.7  | 407.4  | 414.1  | 414.1  |
| 25°   | 1659.6 | 1409.2 | 761.4  | 410.7  | 404.1  | 400.7  | 397.4  | 397.4  | 394.0  | 400.7  | 397.4  |
| 27.5° | 1723.1 | 1432.6 | 684.6  | 397.4  | 394.0  | 390.7  | 387.4  | 384.0  | 380.7  | 387.4  | 384.0  |
| 30°   | 1796.6 | 1455.9 | 611.1  | 390.7  | 384.0  | 380.7  | 374.0  | 370.7  | 364.0  | 370.7  | 370.7  |
| 32.5° | 1863.3 | 1479.3 | 554.3  | 387.4  | 377.3  | 364.0  | 354.0  | 347.3  | 344.0  | 350.6  | 354.0  |
| 35°   | 1933.5 | 1516.1 | 524.3  | 394.0  | 370.7  | 350.6  | 333.9  | 323.9  | 320.6  | 327.3  | 330.6  |
| 37.5° | 2017.0 | 1559.5 | 517.6  | 407.4  | 364.0  | 333.9  | 310.6  | 293.9  | 290.5  | 297.2  | 300.5  |
| 40°   | 2133.8 | 1619.6 | 531.0  | 414.1  | 354.0  | 313.9  | 280.5  | 263.8  | 253.8  | 253.8  | 257.1  |
| 42.5° | 2284.1 | 1746.5 | 541.0  | 420.8  | 337.3  | 290.5  | 253.8  | 230.4  | 213.7  | 213.7  | 217.1  |
| 45°   | 2514.5 | 1956.8 | 591.1  | 414.1  | 320.6  | 260.5  | 223.7  | 193.7  | 180.3  | 180.3  | 183.7  |
| 47.5° | 2825.1 | 2250.7 | 731.3  | 400.7  | 297.2  | 233.8  | 193.7  | 167.0  | 156.9  | 156.9  | 156.9  |
| 50°   | 3235.8 | 2618.0 | 881.6  | 377.3  | 270.5  | 207.0  | 167.0  | 150.3  | 143.6  | 140.3  | 136.9  |
| 52.5° | 3726.7 | 3005.4 | 988.4  | 354.0  | 247.1  | 183.7  | 150.3  | 136.9  | 130.2  | 126.9  | 126.9  |
| 55°   | 4200.9 | 3279.2 | 1025.2 | 330.6  | 223.7  | 163.6  | 140.3  | 130.2  | 123.6  | 120.2  | 120.2  |
| 57.5° | 4488.1 | 3332.6 | 874.9  | 303.9  | 200.4  | 150.3  | 126.9  | 120.2  | 113.5  | 110.2  | 110.2  |
| 60°   | 4554.8 | 3102.2 | 617.8  | 267.1  | 173.6  | 133.6  | 116.9  | 110.2  | 103.5  | 96.8   | 96.8   |
| 62.5° | 4317.8 | 2564.6 | 430.8  | 217.1  | 153.6  | 120.2  | 106.9  | 100.2  | 90.2   | 83.5   | 80.1   |
| 65°   | 3840.2 | 1873.4 | 303.9  | 170.3  | 133.6  | 106.9  | 93.5   | 86.8   | 76.8   | 66.8   | 63.4   |
| 67.5° | 3352.7 | 1135.4 | 197.0  | 140.3  | 116.9  | 86.8   | 80.1   | 76.8   | 66.8   | 56.8   | 56.8   |
| 70°   | 2775.0 | 581.0  | 136.9  | 113.5  | 96.8   | 70.1   | 66.8   | 66.8   | 60.1   | 50.1   | 50.1   |
| 72.5° | 2140.5 | 213.7  | 93.5   | 90.2   | 73.5   | 53.4   | 60.1   | 56.8   | 50.1   | 43.4   | 43.4   |
| 75°   | 1452.6 | 103.5  | 70.1   | 63.4   | 50.1   | 43.4   | 46.8   | 46.8   | 43.4   | 36.7   | 33.4   |
| 77.5° | 460.8  | 66.8   | 53.4   | 50.1   | 40.1   | 36.7   | 40.1   | 40.1   | 33.4   | 30.1   | 26.7   |
| 80°   | 116.9  | 46.8   | 43.4   | 36.7   | 30.1   | 30.1   | 33.4   | 26.7   | 26.7   | 23.4   | 23.4   |
| 82.5° | 50.1   | 33.4   | 30.1   | 26.7   | 23.4   | 23.4   | 23.4   | 23.4   | 20.0   | 20.0   | 20.0   |
| 85°   | 26.7   | 23.4   | 20.0   | 20.0   | 20.0   | 16.7   | 16.7   | 20.0   | 16.7   | 16.7   | 16.7   |
| 87.5° | 16.7   | 16.7   | 13.4   | 10.0   | 10.0   | 13.4   | 13.4   | 13.4   | 13.4   | 13.4   | 13.4   |
| 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

McGraw-Edison

Report Number: SP1-2407-184-2

Test Date: 10/09/2024

Luminaire Tested: GSS-SB1A-722-U-5WQ

Data in this report applies to families of products including GSS-SB1A-722-U-5WQ

### Test Information

Test Method: LM-79-2019  
 Report Number: SP1-2407-184-2  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry:  $4\pi$   
 Issue Date: 10/15/2024  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: McGraw-Edison  
 Catalog Number: **GSS-SB1A-722-U-5WQ**  
 Description: GALLEON II SITE SLIM 1SQ 350MA 5WQ HIGH DENSITY LIGHTSQUARE WITH 70 CRI  
 2200K CCT 26 LEDS

### Spectral Parameters

|                           |          |           |      |      |       |
|---------------------------|----------|-----------|------|------|-------|
| CCT (K):                  | 2160     | CRI (Ra): | 71.9 |      |       |
| CIE u':                   | 0.2927   | R1:       | 68.7 | R9:  | -17.8 |
| CIE v':                   | 0.5388   | R2:       | 82.6 | R10: | 60.5  |
| Duv:                      | 0.0015   | R3:       | 95.5 | R11: | 60.2  |
| CIE x:                    | 0.5130   | R4:       | 66.4 | R12: | 48.2  |
| CIE y:                    | 0.4197   | R5:       | 65.4 | R13: | 70.7  |
| CIE z:                    | 0.0674   | R6:       | 75.9 | R14: | 96.8  |
| Peak Wavelength (nm):     | 609      | R7:       | 77.2 | R15: | 61.8  |
| Dominant Wavelength (nm): | 587      | R8:       | 43.5 |      |       |
| Purity:                   | 79.96089 |           |      |      |       |
| Rf:                       | 70.6     |           |      |      |       |
| Rg:                       | 97.6     |           |      |      |       |



### Test Conditions

Stabilization Time: 21M  
 Operation Time: 1H 21M  
 Sphere Temperature (°C): 25.2

REPORT NUMBER: SP1-2407-184-2

| 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           |



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### Photopic Flux vs. Wavelength



### Photopic Lumens: NR

| $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) |
|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|
| 360               | 0                                    | NR                             | 490               | 27                                   | NR                             | 620               | 966                                  | NR                             | 750               | 46                                   | NR                             | 880               | 1                                    | NR                             |
| 365               | 0                                    | NR                             | 495               | 42                                   | NR                             | 625               | 930                                  | NR                             | 755               | 39                                   | NR                             | 885               | 1                                    | NR                             |
| 370               | 0                                    | NR                             | 500               | 67                                   | NR                             | 630               | 888                                  | NR                             | 760               | 34                                   | NR                             | 890               | 1                                    | NR                             |
| 375               | 0                                    | NR                             | 505               | 101                                  | NR                             | 635               | 835                                  | NR                             | 765               | 30                                   | NR                             | 895               | 1                                    | NR                             |
| 380               | 0                                    | NR                             | 510               | 139                                  | NR                             | 640               | 778                                  | NR                             | 770               | 26                                   | NR                             | 900               | 1                                    | NR                             |
| 385               | 0                                    | NR                             | 515               | 183                                  | NR                             | 645               | 717                                  | NR                             | 775               | 22                                   | NR                             | 905               | 1                                    | NR                             |
| 390               | 0                                    | NR                             | 520               | 224                                  | NR                             | 650               | 656                                  | NR                             | 780               | 19                                   | NR                             | 910               | 1                                    | NR                             |
| 395               | 0                                    | NR                             | 525               | 262                                  | NR                             | 655               | 595                                  | NR                             | 785               | 17                                   | NR                             | 915               | 1                                    | NR                             |
| 400               | 1                                    | NR                             | 530               | 299                                  | NR                             | 660               | 536                                  | NR                             | 790               | 15                                   | NR                             | 920               | 1                                    | NR                             |
| 405               | 3                                    | NR                             | 535               | 332                                  | NR                             | 665               | 480                                  | NR                             | 795               | 13                                   | NR                             | 925               | 1                                    | NR                             |
| 410               | 7                                    | NR                             | 540               | 365                                  | NR                             | 670               | 425                                  | NR                             | 800               | 11                                   | NR                             | 930               | 1                                    | NR                             |
| 415               | 17                                   | NR                             | 545               | 400                                  | NR                             | 675               | 376                                  | NR                             | 805               | 10                                   | NR                             | 935               | 0                                    | NR                             |
| 420               | 36                                   | NR                             | 550               | 437                                  | NR                             | 680               | 332                                  | NR                             | 810               | 8                                    | NR                             | 940               | 0                                    | NR                             |
| 425               | 67                                   | NR                             | 555               | 479                                  | NR                             | 685               | 291                                  | NR                             | 815               | 8                                    | NR                             | 945               | 0                                    | NR                             |
| 430               | 105                                  | NR                             | 560               | 525                                  | NR                             | 690               | 255                                  | NR                             | 820               | 7                                    | NR                             | 950               | 0                                    | NR                             |
| 435               | 141                                  | NR                             | 565               | 579                                  | NR                             | 695               | 221                                  | NR                             | 825               | 6                                    | NR                             | 955               | 0                                    | NR                             |
| 440               | 169                                  | NR                             | 570               | 639                                  | NR                             | 700               | 192                                  | NR                             | 830               | 5                                    | NR                             | 960               | 0                                    | NR                             |
| 445               | 173                                  | NR                             | 575               | 703                                  | NR                             | 705               | 167                                  | NR                             | 835               | 4                                    | NR                             | 965               | 0                                    | NR                             |
| 450               | 136                                  | NR                             | 580               | 769                                  | NR                             | 710               | 144                                  | NR                             | 840               | 4                                    | NR                             | 970               | 0                                    | NR                             |
| 455               | 80                                   | NR                             | 585               | 832                                  | NR                             | 715               | 125                                  | NR                             | 845               | 3                                    | NR                             | 975               | 0                                    | NR                             |
| 460               | 45                                   | NR                             | 590               | 890                                  | NR                             | 720               | 109                                  | NR                             | 850               | 3                                    | NR                             | 980               | 0                                    | NR                             |
| 465               | 32                                   | NR                             | 595               | 937                                  | NR                             | 725               | 94                                   | NR                             | 855               | 3                                    | NR                             | 985               | 0                                    | NR                             |
| 470               | 23                                   | NR                             | 600               | 972                                  | NR                             | 730               | 81                                   | NR                             | 860               | 2                                    | NR                             | 990               | 0                                    | NR                             |
| 475               | 18                                   | NR                             | 605               | 992                                  | NR                             | 735               | 70                                   | NR                             | 865               | 2                                    | NR                             | 995               | 0                                    | NR                             |
| 480               | 18                                   | NR                             | 610               | 998                                  | NR                             | 740               | 61                                   | NR                             | 870               | 2                                    | NR                             | 1000              | 0                                    | NR                             |
| 485               | 20                                   | NR                             | 615               | 990                                  | NR                             | 745               | 53                                   | NR                             | 875               | 2                                    | NR                             |                   |                                      |                                |

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### Scotopic Flux vs. Wavelength



Scotopic Lumens: NR

S/P: 0.8

| λ (nm) | Power W <sup>λ</sup> /nm | Lumens (Φ/nm) | λ (nm) | Power W <sup>λ</sup> /nm | Lumens (Φ/nm) | λ (nm) | Power W <sup>λ</sup> /nm | Lumens (Φ/nm) | λ (nm) | Power W <sup>λ</sup> /nm | Lumens (Φ/nm) | λ (nm) | Power W <sup>λ</sup> /nm | Lumens (Φ/nm) |
|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|
| 360    | 0                        | NR            | 490    | 27                       | NR            | 620    | 966                      | NR            | 750    | 46                       | NR            | 880    | 1                        | NR            |
| 365    | 0                        | NR            | 495    | 42                       | NR            | 625    | 930                      | NR            | 755    | 39                       | NR            | 885    | 1                        | NR            |
| 370    | 0                        | NR            | 500    | 67                       | NR            | 630    | 888                      | NR            | 760    | 34                       | NR            | 890    | 1                        | NR            |
| 375    | 0                        | NR            | 505    | 101                      | NR            | 635    | 835                      | NR            | 765    | 30                       | NR            | 895    | 1                        | NR            |
| 380    | 0                        | NR            | 510    | 139                      | NR            | 640    | 778                      | NR            | 770    | 26                       | NR            | 900    | 1                        | NR            |
| 385    | 0                        | NR            | 515    | 183                      | NR            | 645    | 717                      | NR            | 775    | 22                       | NR            | 905    | 1                        | NR            |
| 390    | 0                        | NR            | 520    | 224                      | NR            | 650    | 656                      | NR            | 780    | 19                       | NR            | 910    | 1                        | NR            |
| 395    | 0                        | NR            | 525    | 262                      | NR            | 655    | 595                      | NR            | 785    | 17                       | NR            | 915    | 1                        | NR            |
| 400    | 1                        | NR            | 530    | 299                      | NR            | 660    | 536                      | NR            | 790    | 15                       | NR            | 920    | 1                        | NR            |
| 405    | 3                        | NR            | 535    | 332                      | NR            | 665    | 480                      | NR            | 795    | 13                       | NR            | 925    | 1                        | NR            |
| 410    | 7                        | NR            | 540    | 365                      | NR            | 670    | 425                      | NR            | 800    | 11                       | NR            | 930    | 1                        | NR            |
| 415    | 17                       | NR            | 545    | 400                      | NR            | 675    | 376                      | NR            | 805    | 10                       | NR            | 935    | 0                        | NR            |
| 420    | 36                       | NR            | 550    | 437                      | NR            | 680    | 332                      | NR            | 810    | 8                        | NR            | 940    | 0                        | NR            |
| 425    | 67                       | NR            | 555    | 479                      | NR            | 685    | 291                      | NR            | 815    | 8                        | NR            | 945    | 0                        | NR            |
| 430    | 105                      | NR            | 560    | 525                      | NR            | 690    | 255                      | NR            | 820    | 7                        | NR            | 950    | 0                        | NR            |
| 435    | 141                      | NR            | 565    | 579                      | NR            | 695    | 221                      | NR            | 825    | 6                        | NR            | 955    | 0                        | NR            |
| 440    | 169                      | NR            | 570    | 639                      | NR            | 700    | 192                      | NR            | 830    | 5                        | NR            | 960    | 0                        | NR            |
| 445    | 173                      | NR            | 575    | 703                      | NR            | 705    | 167                      | NR            | 835    | 4                        | NR            | 965    | 0                        | NR            |
| 450    | 136                      | NR            | 580    | 769                      | NR            | 710    | 144                      | NR            | 840    | 4                        | NR            | 970    | 0                        | NR            |
| 455    | 80                       | NR            | 585    | 832                      | NR            | 715    | 125                      | NR            | 845    | 3                        | NR            | 975    | 0                        | NR            |
| 460    | 45                       | NR            | 590    | 890                      | NR            | 720    | 109                      | NR            | 850    | 3                        | NR            | 980    | 0                        | NR            |
| 465    | 32                       | NR            | 595    | 937                      | NR            | 725    | 94                       | NR            | 855    | 3                        | NR            | 985    | 0                        | NR            |
| 470    | 23                       | NR            | 600    | 972                      | NR            | 730    | 81                       | NR            | 860    | 2                        | NR            | 990    | 0                        | NR            |
| 475    | 18                       | NR            | 605    | 992                      | NR            | 735    | 70                       | NR            | 865    | 2                        | NR            | 995    | 0                        | NR            |
| 480    | 18                       | NR            | 610    | 998                      | NR            | 740    | 61                       | NR            | 870    | 2                        | NR            | 1000   | 0                        | NR            |
| 485    | 20                       | NR            | 615    | 990                      | NR            | 745    | 53                       | NR            | 875    | 2                        | NR            |        |                          |               |

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### Melanopic Flux vs. Wavelength


**Melanopic Lumens: NR**
**M/P: 1.21**

| $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) |
|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|
| 360               | 0                                    | NR                             | 490               | 27                                   | NR                             | 620               | 966                                  | NR                             | 750               | 46                                   | NR                             | 880               | 1                                    | NR                             |
| 365               | 0                                    | NR                             | 495               | 42                                   | NR                             | 625               | 930                                  | NR                             | 755               | 39                                   | NR                             | 885               | 1                                    | NR                             |
| 370               | 0                                    | NR                             | 500               | 67                                   | NR                             | 630               | 888                                  | NR                             | 760               | 34                                   | NR                             | 890               | 1                                    | NR                             |
| 375               | 0                                    | NR                             | 505               | 101                                  | NR                             | 635               | 835                                  | NR                             | 765               | 30                                   | NR                             | 895               | 1                                    | NR                             |
| 380               | 0                                    | NR                             | 510               | 139                                  | NR                             | 640               | 778                                  | NR                             | 770               | 26                                   | NR                             | 900               | 1                                    | NR                             |
| 385               | 0                                    | NR                             | 515               | 183                                  | NR                             | 645               | 717                                  | NR                             | 775               | 22                                   | NR                             | 905               | 1                                    | NR                             |
| 390               | 0                                    | NR                             | 520               | 224                                  | NR                             | 650               | 656                                  | NR                             | 780               | 19                                   | NR                             | 910               | 1                                    | NR                             |
| 395               | 0                                    | NR                             | 525               | 262                                  | NR                             | 655               | 595                                  | NR                             | 785               | 17                                   | NR                             | 915               | 1                                    | NR                             |
| 400               | 1                                    | NR                             | 530               | 299                                  | NR                             | 660               | 536                                  | NR                             | 790               | 15                                   | NR                             | 920               | 1                                    | NR                             |
| 405               | 3                                    | NR                             | 535               | 332                                  | NR                             | 665               | 480                                  | NR                             | 795               | 13                                   | NR                             | 925               | 1                                    | NR                             |
| 410               | 7                                    | NR                             | 540               | 365                                  | NR                             | 670               | 425                                  | NR                             | 800               | 11                                   | NR                             | 930               | 1                                    | NR                             |
| 415               | 17                                   | NR                             | 545               | 400                                  | NR                             | 675               | 376                                  | NR                             | 805               | 10                                   | NR                             | 935               | 0                                    | NR                             |
| 420               | 36                                   | NR                             | 550               | 437                                  | NR                             | 680               | 332                                  | NR                             | 810               | 8                                    | NR                             | 940               | 0                                    | NR                             |
| 425               | 67                                   | NR                             | 555               | 479                                  | NR                             | 685               | 291                                  | NR                             | 815               | 8                                    | NR                             | 945               | 0                                    | NR                             |
| 430               | 105                                  | NR                             | 560               | 525                                  | NR                             | 690               | 255                                  | NR                             | 820               | 7                                    | NR                             | 950               | 0                                    | NR                             |
| 435               | 141                                  | NR                             | 565               | 579                                  | NR                             | 695               | 221                                  | NR                             | 825               | 6                                    | NR                             | 955               | 0                                    | NR                             |
| 440               | 169                                  | NR                             | 570               | 639                                  | NR                             | 700               | 192                                  | NR                             | 830               | 5                                    | NR                             | 960               | 0                                    | NR                             |
| 445               | 173                                  | NR                             | 575               | 703                                  | NR                             | 705               | 167                                  | NR                             | 835               | 4                                    | NR                             | 965               | 0                                    | NR                             |
| 450               | 136                                  | NR                             | 580               | 769                                  | NR                             | 710               | 144                                  | NR                             | 840               | 4                                    | NR                             | 970               | 0                                    | NR                             |
| 455               | 80                                   | NR                             | 585               | 832                                  | NR                             | 715               | 125                                  | NR                             | 845               | 3                                    | NR                             | 975               | 0                                    | NR                             |
| 460               | 45                                   | NR                             | 590               | 890                                  | NR                             | 720               | 109                                  | NR                             | 850               | 3                                    | NR                             | 980               | 0                                    | NR                             |
| 465               | 32                                   | NR                             | 595               | 937                                  | NR                             | 725               | 94                                   | NR                             | 855               | 3                                    | NR                             | 985               | 0                                    | NR                             |
| 470               | 23                                   | NR                             | 600               | 972                                  | NR                             | 730               | 81                                   | NR                             | 860               | 2                                    | NR                             | 990               | 0                                    | NR                             |
| 475               | 18                                   | NR                             | 605               | 992                                  | NR                             | 735               | 70                                   | NR                             | 865               | 2                                    | NR                             | 995               | 0                                    | NR                             |
| 480               | 18                                   | NR                             | 610               | 998                                  | NR                             | 740               | 61                                   | NR                             | 870               | 2                                    | NR                             | 1000              | 0                                    | NR                             |
| 485               | 20                                   | NR                             | 615               | 990                                  | NR                             | 745               | 53                                   | NR                             | 875               | 2                                    | NR                             |                   |                                      |                                |

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TM-30-18

### Summary

$R_f = 70.6$   
 $R_g = 97.6$   
 $CIE\ R_a = 71.9$   
 $R_g = -17.8$



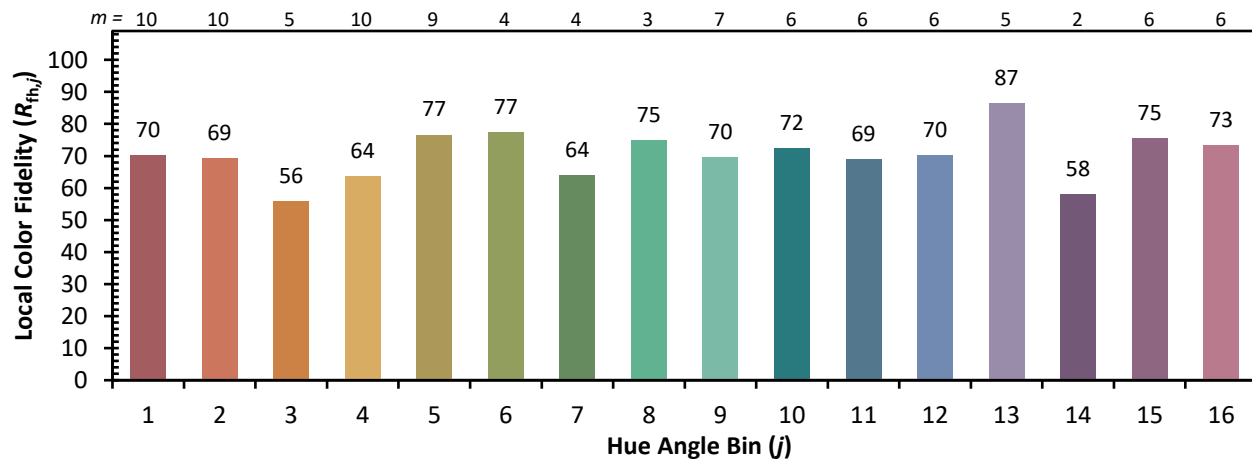
### Color Vector Graphics



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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 87 | CES26 = 60 | CES51 = 74 | CES76 = 58 |
| CES02 = 65 | CES27 = 77 | CES52 = 77 | CES77 = 82 |
| CES03 = 32 | CES28 = 85 | CES53 = 65 | CES78 = 65 |
| CES04 = 72 | CES29 = 50 | CES54 = 77 | CES79 = 86 |
| CES05 = 52 | CES30 = 49 | CES55 = 74 | CES80 = 85 |
| CES06 = 53 | CES31 = 55 | CES56 = 64 | CES81 = 61 |
| CES07 = 44 | CES32 = 55 | CES57 = 60 | CES82 = 93 |
| CES08 = 43 | CES33 = 55 | CES58 = 64 | CES83 = 83 |
| CES09 = 29 | CES34 = 75 | CES59 = 84 | CES84 = 93 |
| CES10 = 79 | CES35 = 88 | CES60 = 89 | CES85 = 81 |
| CES11 = 62 | CES36 = 78 | CES61 = 84 | CES86 = 55 |
| CES12 = 68 | CES37 = 82 | CES62 = 68 | CES87 = 79 |
| CES13 = 45 | CES38 = 54 | CES63 = 68 | CES88 = 72 |
| CES14 = 75 | CES39 = 90 | CES64 = 69 | CES89 = 62 |
| CES15 = 72 | CES40 = 86 | CES65 = 66 | CES90 = 67 |
| CES16 = 49 | CES41 = 75 | CES66 = 64 | CES91 = 89 |
| CES17 = 51 | CES42 = 83 | CES67 = 63 | CES92 = 67 |
| CES18 = 57 | CES43 = 68 | CES68 = 71 | CES93 = 78 |
| CES19 = 74 | CES44 = 98 | CES69 = 81 | CES94 = 52 |
| CES20 = 68 | CES45 = 76 | CES70 = 65 | CES95 = 76 |
| CES21 = 89 | CES46 = 68 | CES71 = 64 | CES96 = 78 |
| CES22 = 81 | CES47 = 60 | CES72 = 88 | CES97 = 76 |
| CES23 = 92 | CES48 = 47 | CES73 = 59 | CES98 = 71 |
| CES24 = 92 | CES49 = 65 | CES74 = 85 | CES99 = 65 |
| CES25 = 74 | CES50 = 74 | CES75 = 66 |            |



**Color Rendition by Hue-Angle Bin**


**Measure Comparisons**



(END OF REPORT)