

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: P867870

Luminaire Tested: **MEM2-HSN-SA-60-740-U-T1**

Issue Date: 08/21/2024



**Test Information**

Test Method: LM-79-08  
Report Number: P867870  
Test Lab: INNOVATION CENTER(G3)  
Issue Date: 08/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: STREETWORKS  
Catalog Number: MEM2-HSN-SA-60-740-U-T1  
Description: EPIC MODERN SHORT HOUSING DISCRETE LED ARRAYS 60W 70CRI 4000K  
FIXTURE w/ TYPE 1 DISTRIBUTION OPTIC  
Light Source: (10) 4000K CCT, 70 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

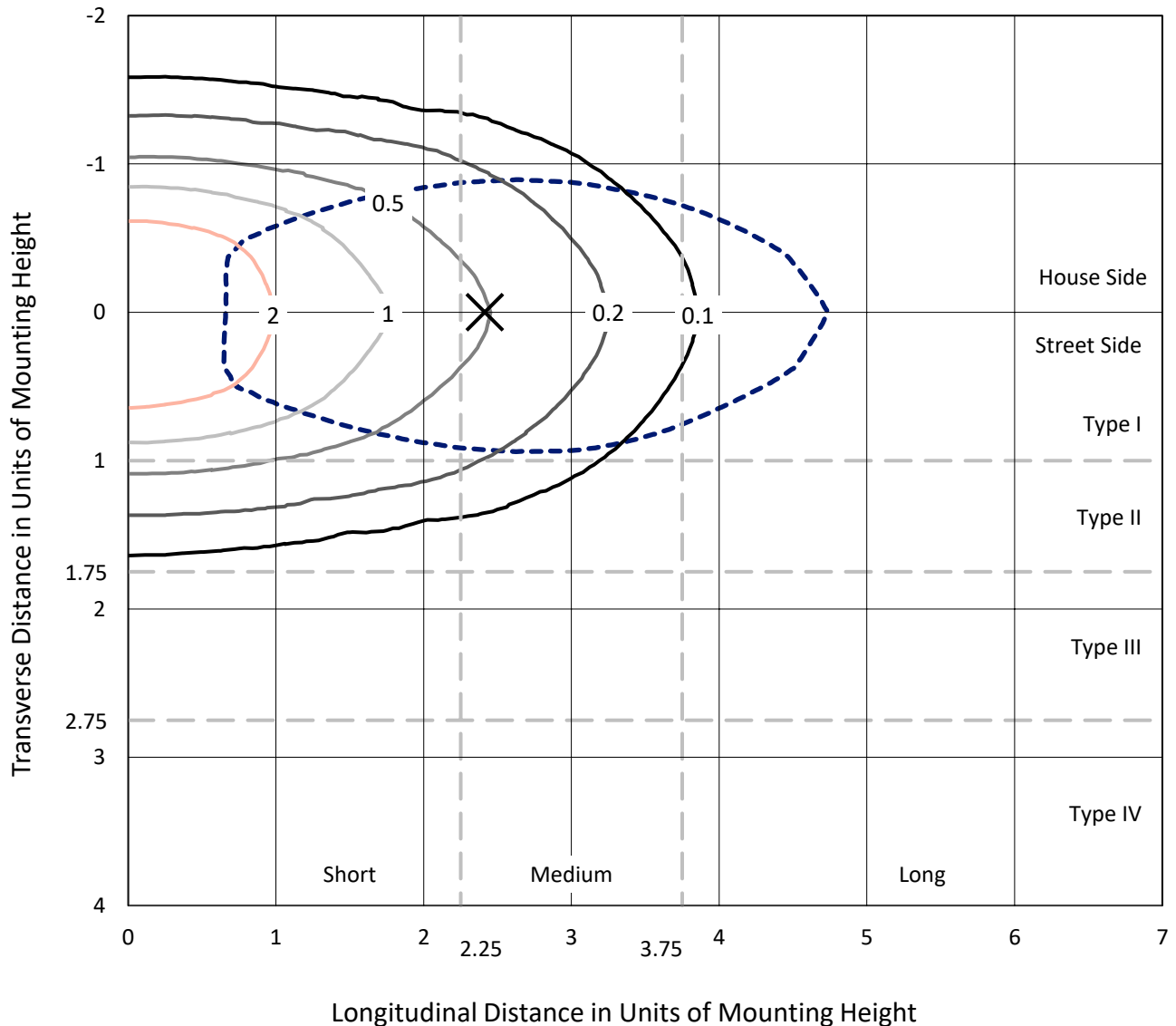
Lumens per Lamp: N/A  
Luminaire Lumens: 6495 lumens  
Efficiency: N/A  
Efficacy: 147.6 lumens/watt  
Luminous Opening: Rectangular (W 0.33' x L: 0.33' x H: 0')  
IES Classification: Type I - Short  
BUG Rating: B2 - U0 - G2

Input Watts (W): 44  
Input Voltage (V): 120  
Input Current (A<sub>in</sub>): NR  
Voltage Rise (V): NR  
Power Factor: 0.99  
Total Harmonic Distortion (THDi): 6.91%  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

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 CATALOG NUMBER: MEM2-HSN-SA-60-740-U-T1

### Iso-Footcandle Lines of Horizontal Illumination

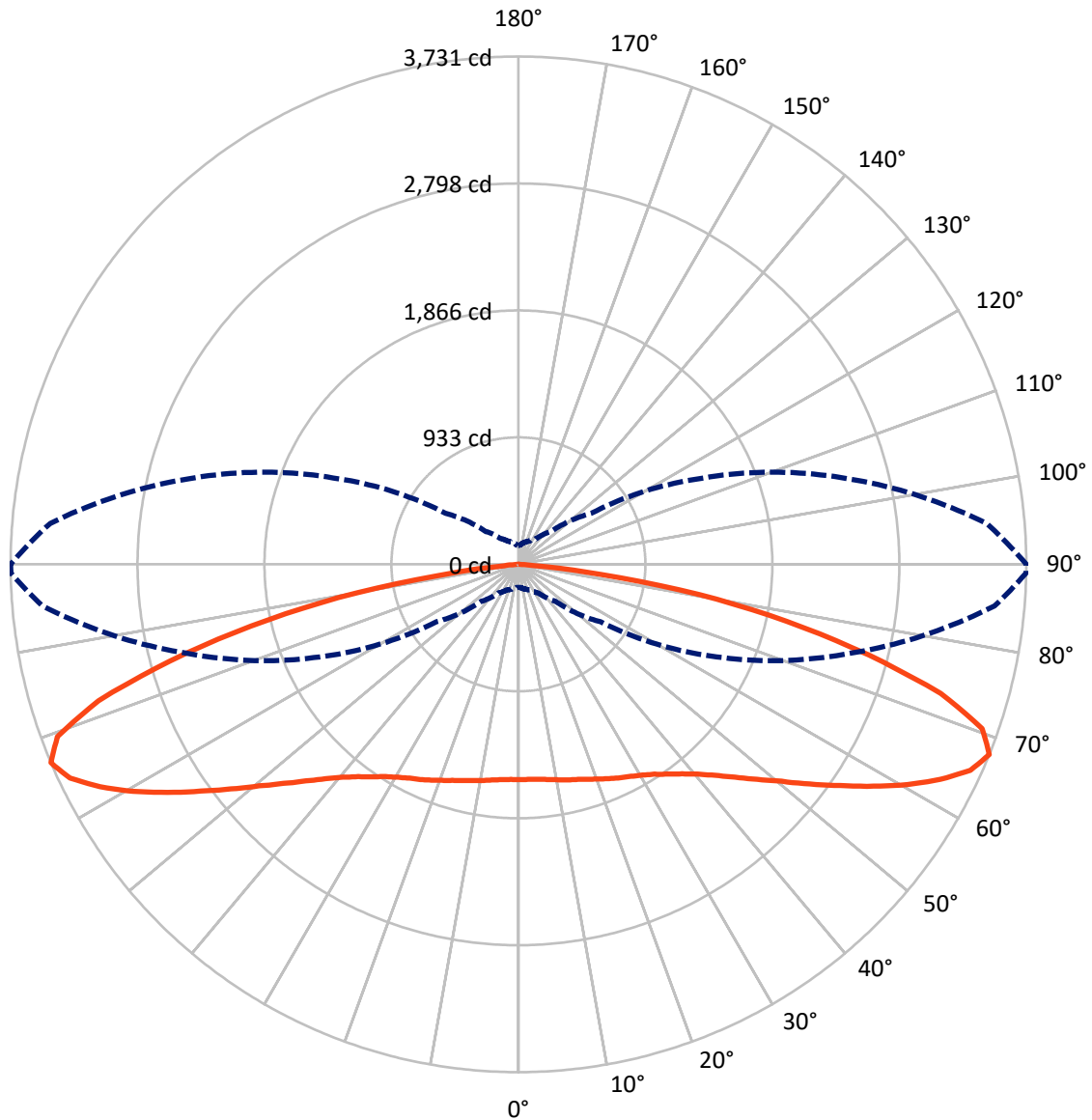
× Max cd  
 - - - 1/2 Max cd



Based on 20 foot mounting height. Maximum calculated value = 4 fc  
 Type I - Short - N/A

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### Luminous Intensity Polar Plot



— Vertical Plane Through 90-Deg Lateral    - - - Horizontal Cone Through 67.5-Deg Vertical

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**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 3189.8   | 0.0    | 3189.8 |
|                    | % Fixture | 49.1     | 0.0    | 49.1   |
| <b>Street Side</b> | Lumens    | 3305.2   | 0.0    | 3305.2 |
|                    | % Fixture | 50.9     | 0.0    | 50.9   |
| <b>Total</b>       | Lumens    | 6495.0   | 0.0    | 6495.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**Coefficient of Utilization**

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 151.7  | 2.3       |
| 10°-20°   | 455.8  | 7.0       |
| 20°-30°   | 754.3  | 11.6      |
| 30°-40°   | 1000.2 | 15.4      |
| 40°-50°   | 1127.7 | 17.4      |
| 50°-60°   | 1156.0 | 17.8      |
| 60°-70°   | 1091.9 | 16.8      |
| 70°-80°   | 670.0  | 10.3      |
| 80°-90°   | 87.6   | 1.3       |
| 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°    | 6495.0 | 100.0     |
| 0°-180°   | 6495.0 | 100.0     |



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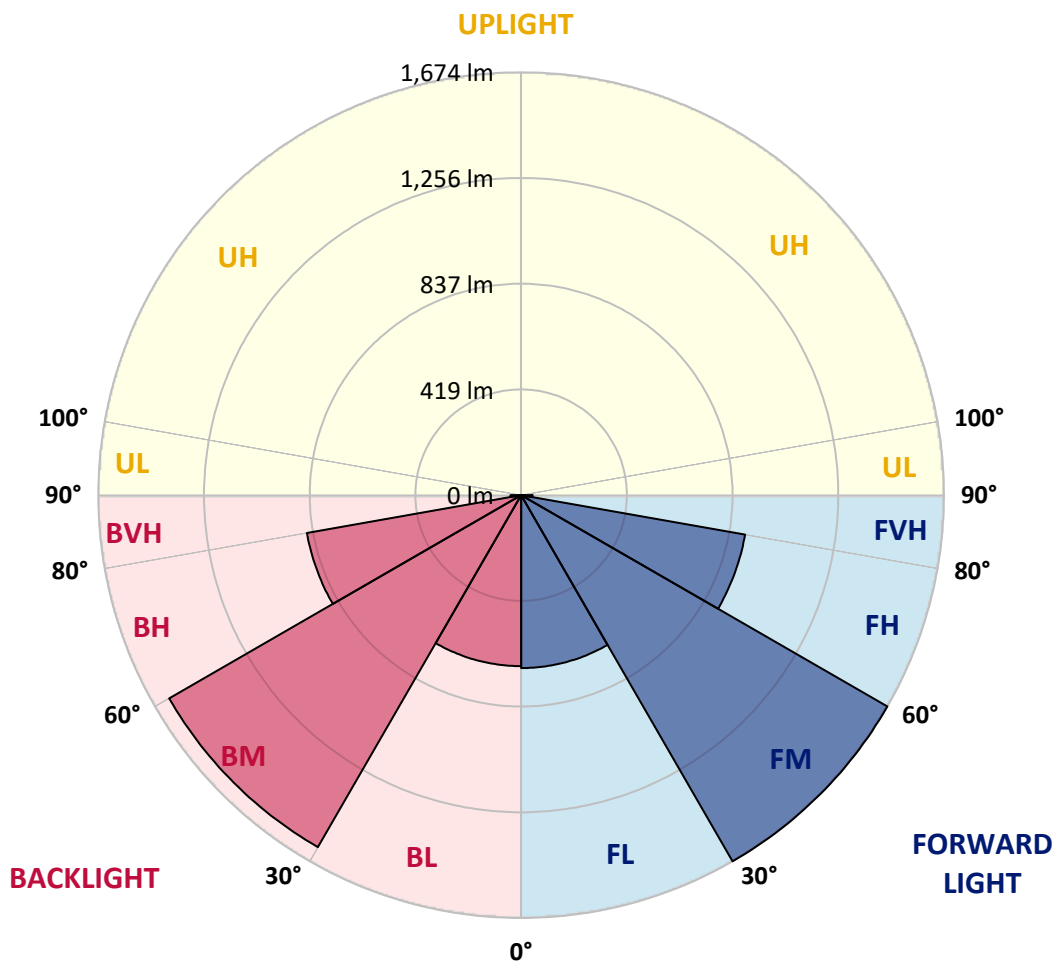
CATALOG NUMBER: MEM2-HSN-SA-60-740-U-T1

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

| Zone           | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|----------------|--------|-----------|-------------------------|------|---------|
|                |        |           | B                       | U    | G       |
| FL (0°-30°)    | 684.8  | 10.5      |                         |      |         |
| FM (30°-60°)   | 1674.3 | 25.8      |                         |      |         |
| FH (60°-80°)   | 900.4  | 13.9      |                         |      | G1/1800 |
| FVH (80°-90°)  | 45.7   | 0.7       |                         |      | G1/100  |
| BL (0°-30°)    | 676.9  | 10.4      | B2/1000                 |      |         |
| BM (30°-60°)   | 1609.5 | 24.8      | B2/2500                 |      |         |
| BH (60°-80°)   | 861.4  | 13.3      | B2/1000                 |      | G2/1000 |
| BVH (80°-90°)  | 42.0   | 0.6       |                         |      | G1/100  |
| UL (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B2-U0-G2**

Type I Short





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 65°    | 75°    | 85°    | 89°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1582.5 | 1582.5 | 1582.5 | 1582.5 | 1582.5 | 1582.5 | 1582.5 | 1582.5 | 1582.5 | 1582.5 | 1582.5 |
| 2.5°  | 1588.7 | 1588.7 | 1585.0 | 1578.8 | 1577.5 | 1578.8 | 1586.2 | 1582.5 | 1582.5 | 1583.7 | 1582.5 |
| 5°    | 1588.7 | 1588.7 | 1586.2 | 1580.0 | 1580.0 | 1580.0 | 1588.7 | 1585.0 | 1586.2 | 1587.5 | 1587.5 |
| 7.5°  | 1591.2 | 1591.2 | 1588.7 | 1583.7 | 1583.7 | 1583.7 | 1596.2 | 1593.7 | 1593.7 | 1597.5 | 1595.0 |
| 10°   | 1597.5 | 1595.0 | 1592.5 | 1593.7 | 1590.0 | 1596.2 | 1602.4 | 1603.7 | 1608.7 | 1611.2 | 1609.9 |
| 12.5° | 1597.5 | 1595.0 | 1588.7 | 1596.2 | 1596.2 | 1604.9 | 1613.7 | 1618.7 | 1624.9 | 1624.9 | 1624.9 |
| 15°   | 1590.0 | 1587.5 | 1582.5 | 1595.0 | 1600.0 | 1611.2 | 1623.6 | 1631.1 | 1642.4 | 1642.4 | 1641.1 |
| 17.5° | 1581.2 | 1577.5 | 1575.0 | 1593.7 | 1604.9 | 1619.9 | 1638.6 | 1648.6 | 1661.1 | 1662.3 | 1659.8 |
| 20°   | 1565.0 | 1563.8 | 1565.0 | 1590.0 | 1609.9 | 1631.1 | 1653.6 | 1667.3 | 1683.5 | 1688.5 | 1684.8 |
| 22.5° | 1547.6 | 1547.6 | 1552.6 | 1586.2 | 1617.4 | 1646.1 | 1676.0 | 1693.5 | 1709.7 | 1714.7 | 1709.7 |
| 25°   | 1523.9 | 1523.9 | 1533.9 | 1573.8 | 1619.9 | 1662.3 | 1697.2 | 1720.9 | 1735.9 | 1740.9 | 1738.4 |
| 27.5° | 1487.7 | 1487.7 | 1498.9 | 1548.8 | 1612.4 | 1674.8 | 1719.7 | 1747.1 | 1763.3 | 1768.3 | 1765.8 |
| 30°   | 1436.6 | 1434.1 | 1449.1 | 1511.4 | 1598.7 | 1688.5 | 1745.9 | 1774.5 | 1795.7 | 1799.5 | 1795.7 |
| 32.5° | 1355.5 | 1359.3 | 1381.7 | 1460.3 | 1576.3 | 1697.2 | 1777.0 | 1810.7 | 1834.4 | 1841.9 | 1839.4 |
| 35°   | 1257.0 | 1263.3 | 1294.4 | 1395.4 | 1533.9 | 1696.0 | 1809.5 | 1850.6 | 1881.8 | 1891.8 | 1890.5 |
| 37.5° | 1139.8 | 1148.5 | 1187.2 | 1305.7 | 1470.3 | 1677.3 | 1839.4 | 1895.5 | 1936.7 | 1949.1 | 1951.6 |
| 40°   | 1011.4 | 1020.1 | 1070.0 | 1200.9 | 1384.2 | 1633.6 | 1856.8 | 1946.6 | 2001.5 | 2026.4 | 2030.2 |
| 42.5° | 875.4  | 890.4  | 950.2  | 1077.4 | 1280.7 | 1563.8 | 1856.8 | 1996.5 | 2063.9 | 2110.0 | 2113.7 |
| 45°   | 744.5  | 757.0  | 829.3  | 954.0  | 1169.7 | 1474.0 | 1835.6 | 2046.4 | 2148.7 | 2228.5 | 2226.0 |
| 47.5° | 631.0  | 634.7  | 700.8  | 826.8  | 1046.3 | 1371.7 | 1792.0 | 2091.3 | 2238.4 | 2344.4 | 2366.9 |
| 50°   | 513.8  | 522.5  | 578.6  | 703.3  | 920.3  | 1259.5 | 1718.4 | 2120.0 | 2330.7 | 2491.6 | 2520.3 |
| 52.5° | 431.5  | 432.7  | 475.1  | 589.9  | 789.4  | 1123.6 | 1629.9 | 2127.5 | 2419.3 | 2651.2 | 2686.1 |
| 55°   | 351.7  | 357.9  | 394.1  | 480.1  | 663.4  | 990.2  | 1515.2 | 2116.2 | 2500.3 | 2805.8 | 2870.7 |
| 57.5° | 301.8  | 303.0  | 329.2  | 397.8  | 559.9  | 848.0  | 1388.0 | 2078.8 | 2567.7 | 2976.7 | 3059.0 |
| 60°   | 259.4  | 259.4  | 279.3  | 331.7  | 452.7  | 709.6  | 1238.3 | 2012.7 | 2605.1 | 3160.0 | 3279.7 |
| 62.5° | 225.7  | 227.0  | 244.4  | 283.1  | 376.6  | 586.1  | 1073.7 | 1909.2 | 2618.8 | 3337.1 | 3474.3 |
| 65°   | 204.5  | 205.8  | 215.7  | 241.9  | 310.5  | 476.4  | 905.4  | 1783.3 | 2600.1 | 3469.3 | 3647.6 |
| 67.5° | 169.6  | 170.8  | 188.3  | 208.3  | 258.1  | 382.8  | 735.8  | 1608.7 | 2524.0 | 3510.4 | 3728.7 |
| 70°   | 129.7  | 133.4  | 157.1  | 178.3  | 214.5  | 305.5  | 564.9  | 1378.0 | 2341.9 | 3370.8 | 3595.2 |
| 72.5° | 108.5  | 109.7  | 127.2  | 150.9  | 179.6  | 239.4  | 429.0  | 1084.9 | 2065.1 | 3010.4 | 3259.8 |
| 75°   | 94.8   | 96.0   | 106.0  | 127.2  | 149.6  | 192.0  | 298.0  | 749.5  | 1647.3 | 2434.2 | 2662.4 |
| 77.5° | 86.0   | 87.3   | 89.8   | 107.2  | 126.0  | 148.4  | 210.8  | 445.2  | 1162.2 | 1860.6 | 1980.3 |
| 80°   | 82.3   | 82.3   | 76.1   | 88.5   | 103.5  | 116.0  | 140.9  | 255.6  | 745.7  | 1254.5 | 1350.5 |
| 82.5° | 58.6   | 57.4   | 52.4   | 54.9   | 63.6   | 63.6   | 72.3   | 106.0  | 285.6  | 530.0  | 574.9  |
| 85°   | 3.7    | 3.7    | 6.2    | 7.5    | 11.2   | 15.0   | 18.7   | 24.9   | 72.3   | 98.5   | 102.3  |
| 87.5° | 1.2    | 1.2    | 1.2    | 1.2    | 1.2    | 2.5    | 2.5    | 2.5    | 3.7    | 5.0    | 5.0    |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |



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**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1582.5 | 1582.5 | 1582.5 | 1582.5 | 1582.5 | 1582.5 | 1582.5 | 1582.5 | 1582.5 | 1582.5 | 1582.5 |
| 2.5°  | 1581.2 | 1582.5 | 1582.5 | 1585.0 | 1587.5 | 1586.2 | 1585.0 | 1587.5 | 1583.7 | 1576.3 | 1575.0 |
| 5°    | 1586.2 | 1586.2 | 1585.0 | 1587.5 | 1590.0 | 1587.5 | 1585.0 | 1585.0 | 1582.5 | 1575.0 | 1573.8 |
| 7.5°  | 1596.2 | 1595.0 | 1595.0 | 1595.0 | 1595.0 | 1591.2 | 1587.5 | 1585.0 | 1581.2 | 1573.8 | 1570.0 |
| 10°   | 1609.9 | 1608.7 | 1607.4 | 1606.2 | 1600.0 | 1596.2 | 1590.0 | 1586.2 | 1581.2 | 1572.5 | 1570.0 |
| 12.5° | 1624.9 | 1622.4 | 1619.9 | 1621.2 | 1608.7 | 1597.5 | 1591.2 | 1582.5 | 1578.8 | 1558.8 | 1555.1 |
| 15°   | 1639.9 | 1636.1 | 1634.9 | 1629.9 | 1617.4 | 1601.2 | 1588.7 | 1576.3 | 1563.8 | 1545.1 | 1538.9 |
| 17.5° | 1659.8 | 1657.3 | 1649.8 | 1644.8 | 1627.4 | 1604.9 | 1586.2 | 1568.8 | 1552.6 | 1530.1 | 1526.4 |
| 20°   | 1683.5 | 1681.0 | 1673.5 | 1663.6 | 1641.1 | 1613.7 | 1587.5 | 1560.1 | 1540.1 | 1513.9 | 1507.7 |
| 22.5° | 1709.7 | 1706.0 | 1699.7 | 1688.5 | 1659.8 | 1627.4 | 1591.2 | 1555.1 | 1525.1 | 1495.2 | 1491.5 |
| 25°   | 1737.1 | 1734.6 | 1728.4 | 1712.2 | 1681.0 | 1641.1 | 1591.2 | 1537.6 | 1500.2 | 1474.0 | 1462.8 |
| 27.5° | 1763.3 | 1762.1 | 1754.6 | 1735.9 | 1703.5 | 1651.1 | 1580.0 | 1508.9 | 1459.0 | 1424.1 | 1416.6 |
| 30°   | 1797.0 | 1794.5 | 1785.8 | 1764.6 | 1728.4 | 1657.3 | 1557.6 | 1460.3 | 1397.9 | 1359.3 | 1348.1 |
| 32.5° | 1838.1 | 1835.6 | 1823.2 | 1797.0 | 1758.3 | 1658.6 | 1525.1 | 1397.9 | 1315.6 | 1274.5 | 1260.8 |
| 35°   | 1893.0 | 1888.0 | 1871.8 | 1840.6 | 1787.0 | 1646.1 | 1467.8 | 1318.1 | 1217.1 | 1163.5 | 1144.8 |
| 37.5° | 1952.9 | 1946.6 | 1925.4 | 1886.8 | 1807.0 | 1612.4 | 1386.7 | 1210.9 | 1096.2 | 1032.6 | 1018.8 |
| 40°   | 2026.4 | 2017.7 | 1985.3 | 1931.7 | 1814.4 | 1553.8 | 1295.7 | 1101.1 | 978.9  | 909.1  | 892.9  |
| 42.5° | 2118.7 | 2103.8 | 2051.4 | 1981.6 | 1799.5 | 1474.0 | 1187.2 | 987.7  | 848.0  | 783.1  | 779.4  |
| 45°   | 2229.7 | 2206.0 | 2127.5 | 2030.2 | 1767.1 | 1374.2 | 1072.5 | 860.5  | 727.0  | 663.4  | 647.2  |
| 47.5° | 2360.7 | 2332.0 | 2216.0 | 2067.6 | 1703.5 | 1272.0 | 949.0  | 737.0  | 614.8  | 549.9  | 537.5  |
| 50°   | 2505.3 | 2477.9 | 2309.5 | 2088.8 | 1634.9 | 1152.3 | 828.0  | 627.3  | 505.1  | 451.4  | 451.4  |
| 52.5° | 2681.1 | 2618.8 | 2399.3 | 2091.3 | 1530.1 | 1020.1 | 712.1  | 520.0  | 424.0  | 376.6  | 366.6  |
| 55°   | 2868.2 | 2794.6 | 2480.4 | 2068.8 | 1421.6 | 899.1  | 587.4  | 432.7  | 347.9  | 314.3  | 305.5  |
| 57.5° | 3076.5 | 2964.2 | 2539.0 | 2023.9 | 1284.5 | 766.9  | 490.1  | 356.7  | 293.1  | 265.6  | 261.9  |
| 60°   | 3286.0 | 3141.3 | 2573.9 | 1947.9 | 1138.5 | 644.7  | 407.8  | 298.0  | 251.9  | 231.9  | 228.2  |
| 62.5° | 3480.5 | 3286.0 | 2576.4 | 1836.9 | 996.4  | 537.5  | 334.2  | 256.9  | 223.2  | 208.3  | 208.3  |
| 65°   | 3648.8 | 3406.9 | 2534.0 | 1694.7 | 815.6  | 431.5  | 275.6  | 217.0  | 194.5  | 178.3  | 174.6  |
| 67.5° | 3731.2 | 3453.1 | 2459.2 | 1500.2 | 653.5  | 341.7  | 231.9  | 188.3  | 167.1  | 142.2  | 139.7  |
| 70°   | 3615.2 | 3319.6 | 2267.1 | 1250.8 | 505.1  | 271.9  | 193.3  | 160.9  | 139.7  | 118.5  | 116.0  |
| 72.5° | 3244.8 | 2964.2 | 1956.6 | 969.0  | 380.3  | 219.5  | 160.9  | 137.2  | 114.7  | 103.5  | 101.0  |
| 75°   | 2655.0 | 2465.4 | 1546.3 | 667.2  | 265.6  | 172.1  | 134.7  | 116.0  | 97.3   | 92.3   | 91.0   |
| 77.5° | 2015.2 | 1833.2 | 1129.8 | 417.8  | 182.1  | 134.7  | 114.7  | 98.5   | 84.8   | 88.5   | 86.0   |
| 80°   | 1345.6 | 1262.0 | 750.7  | 236.9  | 122.2  | 98.5   | 87.3   | 72.3   | 64.8   | 74.8   | 72.3   |
| 82.5° | 611.1  | 578.6  | 352.9  | 103.5  | 54.9   | 42.4   | 29.9   | 22.4   | 17.5   | 16.2   | 18.7   |
| 85°   | 102.3  | 89.8   | 24.9   | 11.2   | 6.2    | 3.7    | 2.5    | 2.5    | 1.2    | 1.2    | 1.2    |
| 87.5° | 5.0    | 3.7    | 3.7    | 2.5    | 1.2    | 1.2    | 1.2    | 1.2    | 1.2    | 0.0    | 0.0    |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |



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

Report Prepared for

Cooper Lighting Solutions

Streetworks

Report Number: SP1-2407-157-5

Test Date: 08/07/2024

Luminaire Tested: MEM2-HTN-SA-40-740-U-5WQ-2

Data in this report applies to families of products including MEM2-HTN-SA-40-740-U-5WQ-2

**Test Information**

Test Method: LM-79-2019  
 Report Number: SP1-2407-157-5  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry: 4π  
 Issue Date: 08/20/2024  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: Streetworks  
 Catalog Number: **MEM2-HTN-SA-40-740-U-5WQ-2**  
 Description: Epic Modern Light Square 40W 5WQ Optic and Flare Trim

**Spectral Parameters**

CCT (K): 3915  
 CIE u': 0.2262  
 CIE v': 0.5044  
 Duv: 0.0010  
 CIE x: 0.3850  
 CIE y: 0.3816  
 CIE z: 0.2334  
 Peak Wavelength (nm): 449  
 Dominant Wavelength (nm): 578  
 Purity: 30.05482  
 R<sub>f</sub>: 73.2  
 R<sub>g</sub>: 93.9

|           |      |      |       |
|-----------|------|------|-------|
| CRI (Ra): | 71.0 |      |       |
| R1:       | 67.6 | R9:  | -38.4 |
| R2:       | 78.3 | R10: | 48.9  |
| R3:       | 87.1 | R11: | 65.3  |
| R4:       | 69.7 | R12: | 40.4  |
| R5:       | 67.4 | R13: | 69.3  |
| R6:       | 69.3 | R14: | 92.6  |
| R7:       | 79.7 | R15: | 59.9  |
| R8:       | 48.7 |      |       |



**Test Conditions**

Stabilization Time: 21M  
 Operation Time: 1H 21M  
 Sphere Temperature (°C): 24.2

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| 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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CIE 1931 Chromaticity Diagram



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



Point lies inside the ANSI 4000K 4-step quadrangle

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**Photopic Flux vs. Wavelength**



**Photopic Lumens: NR**

| $\lambda$<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>( $\phi$ /nm) | $\lambda$<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>( $\phi$ /nm) | $\lambda$<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>( $\phi$ /nm) | $\lambda$<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>( $\phi$ /nm) | $\lambda$<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>( $\phi$ /nm) |
|-------------------|-----------------------------|-------------------------|-------------------|-----------------------------|-------------------------|-------------------|-----------------------------|-------------------------|-------------------|-----------------------------|-------------------------|-------------------|-----------------------------|-------------------------|
| 360               | 0                           | NR                      | 490               | 112                         | NR                      | 620               | 618                         | NR                      | 750               | 15                          | NR                      | 880               | 0                           | NR                      |
| 365               | 0                           | NR                      | 495               | 153                         | NR                      | 625               | 563                         | NR                      | 755               | 13                          | NR                      | 885               | 0                           | NR                      |
| 370               | 0                           | NR                      | 500               | 216                         | NR                      | 630               | 510                         | NR                      | 760               | 11                          | NR                      | 890               | 0                           | NR                      |
| 375               | 0                           | NR                      | 505               | 291                         | NR                      | 635               | 456                         | NR                      | 765               | 9                           | NR                      | 895               | 0                           | NR                      |
| 380               | 0                           | NR                      | 510               | 366                         | NR                      | 640               | 407                         | NR                      | 770               | 8                           | NR                      | 900               | 0                           | NR                      |
| 385               | 0                           | NR                      | 515               | 436                         | NR                      | 645               | 359                         | NR                      | 775               | 7                           | NR                      | 905               | 0                           | NR                      |
| 390               | 0                           | NR                      | 520               | 492                         | NR                      | 650               | 316                         | NR                      | 780               | 6                           | NR                      | 910               | 0                           | NR                      |
| 395               | 2                           | NR                      | 525               | 536                         | NR                      | 655               | 277                         | NR                      | 785               | 5                           | NR                      | 915               | 0                           | NR                      |
| 400               | 4                           | NR                      | 530               | 567                         | NR                      | 660               | 240                         | NR                      | 790               | 4                           | NR                      | 920               | 0                           | NR                      |
| 405               | 7                           | NR                      | 535               | 596                         | NR                      | 665               | 208                         | NR                      | 795               | 4                           | NR                      | 925               | 0                           | NR                      |
| 410               | 12                          | NR                      | 540               | 619                         | NR                      | 670               | 179                         | NR                      | 800               | 3                           | NR                      | 930               | 0                           | NR                      |
| 415               | 25                          | NR                      | 545               | 644                         | NR                      | 675               | 154                         | NR                      | 805               | 3                           | NR                      | 935               | 0                           | NR                      |
| 420               | 51                          | NR                      | 550               | 671                         | NR                      | 680               | 133                         | NR                      | 810               | 3                           | NR                      | 940               | 0                           | NR                      |
| 425               | 100                         | NR                      | 555               | 701                         | NR                      | 685               | 114                         | NR                      | 815               | 2                           | NR                      | 945               | 0                           | NR                      |
| 430               | 180                         | NR                      | 560               | 735                         | NR                      | 690               | 98                          | NR                      | 820               | 2                           | NR                      | 950               | 0                           | NR                      |
| 435               | 315                         | NR                      | 565               | 768                         | NR                      | 695               | 83                          | NR                      | 825               | 2                           | NR                      | 955               | 0                           | NR                      |
| 440               | 514                         | NR                      | 570               | 798                         | NR                      | 700               | 71                          | NR                      | 830               | 1                           | NR                      | 960               | 0                           | NR                      |
| 445               | 828                         | NR                      | 575               | 825                         | NR                      | 705               | 61                          | NR                      | 835               | 1                           | NR                      | 965               | 0                           | NR                      |
| 450               | 992                         | NR                      | 580               | 843                         | NR                      | 710               | 52                          | NR                      | 840               | 1                           | NR                      | 970               | 0                           | NR                      |
| 455               | 652                         | NR                      | 585               | 848                         | NR                      | 715               | 44                          | NR                      | 845               | 1                           | NR                      | 975               | 0                           | NR                      |
| 460               | 382                         | NR                      | 590               | 844                         | NR                      | 720               | 38                          | NR                      | 850               | 1                           | NR                      | 980               | 0                           | NR                      |
| 465               | 282                         | NR                      | 595               | 826                         | NR                      | 725               | 32                          | NR                      | 855               | 1                           | NR                      | 985               | 0                           | NR                      |
| 470               | 180                         | NR                      | 600               | 800                         | NR                      | 730               | 28                          | NR                      | 860               | 1                           | NR                      | 990               | 0                           | NR                      |
| 475               | 119                         | NR                      | 605               | 762                         | NR                      | 735               | 24                          | NR                      | 865               | 1                           | NR                      | 995               | 0                           | NR                      |
| 480               | 101                         | NR                      | 610               | 719                         | NR                      | 740               | 20                          | NR                      | 870               | 1                           | NR                      | 1000              | 0                           | NR                      |
| 485               | 98                          | NR                      | 615               | 669                         | NR                      | 745               | 17                          | NR                      | 875               | 0                           | NR                      |                   |                             |                         |

REPORT NUMBER: SP1-2407-157-5

**Scotopic Flux vs. Wavelength**



**Scotopic Lumens: NR**

**S/P: 1.49**

| $\lambda$<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               | 112                                    | NR                           | 620               | 618                                    | NR                           | 750               | 15                                     | NR                           | 880               | 0                                      | NR                           |
| 365               | 0                                      | NR                           | 495               | 153                                    | NR                           | 625               | 563                                    | NR                           | 755               | 13                                     | NR                           | 885               | 0                                      | NR                           |
| 370               | 0                                      | NR                           | 500               | 216                                    | NR                           | 630               | 510                                    | NR                           | 760               | 11                                     | NR                           | 890               | 0                                      | NR                           |
| 375               | 0                                      | NR                           | 505               | 291                                    | NR                           | 635               | 456                                    | NR                           | 765               | 9                                      | NR                           | 895               | 0                                      | NR                           |
| 380               | 0                                      | NR                           | 510               | 366                                    | NR                           | 640               | 407                                    | NR                           | 770               | 8                                      | NR                           | 900               | 0                                      | NR                           |
| 385               | 0                                      | NR                           | 515               | 436                                    | NR                           | 645               | 359                                    | NR                           | 775               | 7                                      | NR                           | 905               | 0                                      | NR                           |
| 390               | 0                                      | NR                           | 520               | 492                                    | NR                           | 650               | 316                                    | NR                           | 780               | 6                                      | NR                           | 910               | 0                                      | NR                           |
| 395               | 2                                      | NR                           | 525               | 536                                    | NR                           | 655               | 277                                    | NR                           | 785               | 5                                      | NR                           | 915               | 0                                      | NR                           |
| 400               | 4                                      | NR                           | 530               | 567                                    | NR                           | 660               | 240                                    | NR                           | 790               | 4                                      | NR                           | 920               | 0                                      | NR                           |
| 405               | 7                                      | NR                           | 535               | 596                                    | NR                           | 665               | 208                                    | NR                           | 795               | 4                                      | NR                           | 925               | 0                                      | NR                           |
| 410               | 12                                     | NR                           | 540               | 619                                    | NR                           | 670               | 179                                    | NR                           | 800               | 3                                      | NR                           | 930               | 0                                      | NR                           |
| 415               | 25                                     | NR                           | 545               | 644                                    | NR                           | 675               | 154                                    | NR                           | 805               | 3                                      | NR                           | 935               | 0                                      | NR                           |
| 420               | 51                                     | NR                           | 550               | 671                                    | NR                           | 680               | 133                                    | NR                           | 810               | 3                                      | NR                           | 940               | 0                                      | NR                           |
| 425               | 100                                    | NR                           | 555               | 701                                    | NR                           | 685               | 114                                    | NR                           | 815               | 2                                      | NR                           | 945               | 0                                      | NR                           |
| 430               | 180                                    | NR                           | 560               | 735                                    | NR                           | 690               | 98                                     | NR                           | 820               | 2                                      | NR                           | 950               | 0                                      | NR                           |
| 435               | 315                                    | NR                           | 565               | 768                                    | NR                           | 695               | 83                                     | NR                           | 825               | 2                                      | NR                           | 955               | 0                                      | NR                           |
| 440               | 514                                    | NR                           | 570               | 798                                    | NR                           | 700               | 71                                     | NR                           | 830               | 1                                      | NR                           | 960               | 0                                      | NR                           |
| 445               | 828                                    | NR                           | 575               | 825                                    | NR                           | 705               | 61                                     | NR                           | 835               | 1                                      | NR                           | 965               | 0                                      | NR                           |
| 450               | 992                                    | NR                           | 580               | 843                                    | NR                           | 710               | 52                                     | NR                           | 840               | 1                                      | NR                           | 970               | 0                                      | NR                           |
| 455               | 652                                    | NR                           | 585               | 848                                    | NR                           | 715               | 44                                     | NR                           | 845               | 1                                      | NR                           | 975               | 0                                      | NR                           |
| 460               | 382                                    | NR                           | 590               | 844                                    | NR                           | 720               | 38                                     | NR                           | 850               | 1                                      | NR                           | 980               | 0                                      | NR                           |
| 465               | 282                                    | NR                           | 595               | 826                                    | NR                           | 725               | 32                                     | NR                           | 855               | 1                                      | NR                           | 985               | 0                                      | NR                           |
| 470               | 180                                    | NR                           | 600               | 800                                    | NR                           | 730               | 28                                     | NR                           | 860               | 1                                      | NR                           | 990               | 0                                      | NR                           |
| 475               | 119                                    | NR                           | 605               | 762                                    | NR                           | 735               | 24                                     | NR                           | 865               | 1                                      | NR                           | 995               | 0                                      | NR                           |
| 480               | 101                                    | NR                           | 610               | 719                                    | NR                           | 740               | 20                                     | NR                           | 870               | 1                                      | NR                           | 1000              | 0                                      | NR                           |
| 485               | 98                                     | NR                           | 615               | 669                                    | NR                           | 745               | 17                                     | NR                           | 875               | 0                                      | NR                           |                   |  |                              |

REPORT NUMBER: SP1-2407-157-5

**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: NR**

**M/P: 2.88**

| 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    | 112                      | NR            | 620    | 618                      | NR            | 750    | 15                       | NR            | 880    | 0                        | NR            |
| 365    | 0                        | NR            | 495    | 153                      | NR            | 625    | 563                      | NR            | 755    | 13                       | NR            | 885    | 0                        | NR            |
| 370    | 0                        | NR            | 500    | 216                      | NR            | 630    | 510                      | NR            | 760    | 11                       | NR            | 890    | 0                        | NR            |
| 375    | 0                        | NR            | 505    | 291                      | NR            | 635    | 456                      | NR            | 765    | 9                        | NR            | 895    | 0                        | NR            |
| 380    | 0                        | NR            | 510    | 366                      | NR            | 640    | 407                      | NR            | 770    | 8                        | NR            | 900    | 0                        | NR            |
| 385    | 0                        | NR            | 515    | 436                      | NR            | 645    | 359                      | NR            | 775    | 7                        | NR            | 905    | 0                        | NR            |
| 390    | 0                        | NR            | 520    | 492                      | NR            | 650    | 316                      | NR            | 780    | 6                        | NR            | 910    | 0                        | NR            |
| 395    | 2                        | NR            | 525    | 536                      | NR            | 655    | 277                      | NR            | 785    | 5                        | NR            | 915    | 0                        | NR            |
| 400    | 4                        | NR            | 530    | 567                      | NR            | 660    | 240                      | NR            | 790    | 4                        | NR            | 920    | 0                        | NR            |
| 405    | 7                        | NR            | 535    | 596                      | NR            | 665    | 208                      | NR            | 795    | 4                        | NR            | 925    | 0                        | NR            |
| 410    | 12                       | NR            | 540    | 619                      | NR            | 670    | 179                      | NR            | 800    | 3                        | NR            | 930    | 0                        | NR            |
| 415    | 25                       | NR            | 545    | 644                      | NR            | 675    | 154                      | NR            | 805    | 3                        | NR            | 935    | 0                        | NR            |
| 420    | 51                       | NR            | 550    | 671                      | NR            | 680    | 133                      | NR            | 810    | 3                        | NR            | 940    | 0                        | NR            |
| 425    | 100                      | NR            | 555    | 701                      | NR            | 685    | 114                      | NR            | 815    | 2                        | NR            | 945    | 0                        | NR            |
| 430    | 180                      | NR            | 560    | 735                      | NR            | 690    | 98                       | NR            | 820    | 2                        | NR            | 950    | 0                        | NR            |
| 435    | 315                      | NR            | 565    | 768                      | NR            | 695    | 83                       | NR            | 825    | 2                        | NR            | 955    | 0                        | NR            |
| 440    | 514                      | NR            | 570    | 798                      | NR            | 700    | 71                       | NR            | 830    | 1                        | NR            | 960    | 0                        | NR            |
| 445    | 828                      | NR            | 575    | 825                      | NR            | 705    | 61                       | NR            | 835    | 1                        | NR            | 965    | 0                        | NR            |
| 450    | 992                      | NR            | 580    | 843                      | NR            | 710    | 52                       | NR            | 840    | 1                        | NR            | 970    | 0                        | NR            |
| 455    | 652                      | NR            | 585    | 848                      | NR            | 715    | 44                       | NR            | 845    | 1                        | NR            | 975    | 0                        | NR            |
| 460    | 382                      | NR            | 590    | 844                      | NR            | 720    | 38                       | NR            | 850    | 1                        | NR            | 980    | 0                        | NR            |
| 465    | 282                      | NR            | 595    | 826                      | NR            | 725    | 32                       | NR            | 855    | 1                        | NR            | 985    | 0                        | NR            |
| 470    | 180                      | NR            | 600    | 800                      | NR            | 730    | 28                       | NR            | 860    | 1                        | NR            | 990    | 0                        | NR            |
| 475    | 119                      | NR            | 605    | 762                      | NR            | 735    | 24                       | NR            | 865    | 1                        | NR            | 995    | 0                        | NR            |
| 480    | 101                      | NR            | 610    | 719                      | NR            | 740    | 20                       | NR            | 870    | 1                        | NR            | 1000   | 0                        | NR            |
| 485    | 98                       | NR            | 615    | 669                      | NR            | 745    | 17                       | NR            | 875    | 0                        | NR            |        |                          |               |

**Summary**

$R_f = 73.2$   
 $R_g = 93.9$   
 $CIE R_a = 71.0$   
 $R_g = -38.4$



**Color Vector Graphics**





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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 61 | CES51 = 88 | CES76 = 50 |
| CES02 = 61 | CES27 = 88 | CES52 = 87 | CES77 = 69 |
| CES03 = 30 | CES28 = 81 | CES53 = 77 | CES78 = 53 |
| CES04 = 70 | CES29 = 65 | CES54 = 84 | CES79 = 81 |
| CES05 = 47 | CES30 = 81 | CES55 = 83 | CES80 = 78 |
| CES06 = 50 | CES31 = 69 | CES56 = 73 | CES81 = 77 |
| CES07 = 40 | CES32 = 60 | CES57 = 72 | CES82 = 91 |
| CES08 = 39 | CES33 = 76 | CES58 = 73 | CES83 = 89 |
| CES09 = 29 | CES34 = 70 | CES59 = 85 | CES84 = 86 |
| CES10 = 74 | CES35 = 83 | CES60 = 89 | CES85 = 77 |
| CES11 = 57 | CES36 = 91 | CES61 = 81 | CES86 = 71 |
| CES12 = 63 | CES37 = 79 | CES62 = 85 | CES87 = 76 |
| CES13 = 42 | CES38 = 92 | CES63 = 72 | CES88 = 80 |
| CES14 = 74 | CES39 = 96 | CES64 = 64 | CES89 = 70 |
| CES15 = 71 | CES40 = 91 | CES65 = 61 | CES90 = 79 |
| CES16 = 46 | CES41 = 93 | CES66 = 57 | CES91 = 74 |
| CES17 = 49 | CES42 = 80 | CES67 = 54 | CES92 = 57 |
| CES18 = 56 | CES43 = 76 | CES68 = 63 | CES93 = 74 |
| CES19 = 72 | CES44 = 99 | CES69 = 73 | CES94 = 51 |
| CES20 = 65 | CES45 = 85 | CES70 = 55 | CES95 = 65 |
| CES21 = 86 | CES46 = 82 | CES71 = 48 | CES96 = 76 |
| CES22 = 78 | CES47 = 86 | CES72 = 83 | CES97 = 84 |
| CES23 = 92 | CES48 = 77 | CES73 = 45 | CES98 = 75 |
| CES24 = 91 | CES49 = 80 | CES74 = 93 | CES99 = 62 |
| CES25 = 72 | CES50 = 88 | CES75 = 51 |            |



Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)