

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: INVUE

Report Number: P868545

Luminaire Tested: **EMM2-HTN-SA2A-750-U-T3**

Issue Date: 08/22/2024



**Test Information**

Test Method: LM-79-08  
Report Number: P868545  
Test Lab: INNOVATION CENTER(G3)  
Issue Date: 08/22/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: INVUE  
Catalog Number: EMM2-HTN-SA2A-750-U-T3  
Description: EPIC MODERN TALL HOUSING DISCRETE LED ARRAYS 70W 70CRI 5000K  
FIXTURE w/ TYPE III DISTRIBUTION OPTIC  
Light Source: (20) 5000K CCT, 70 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

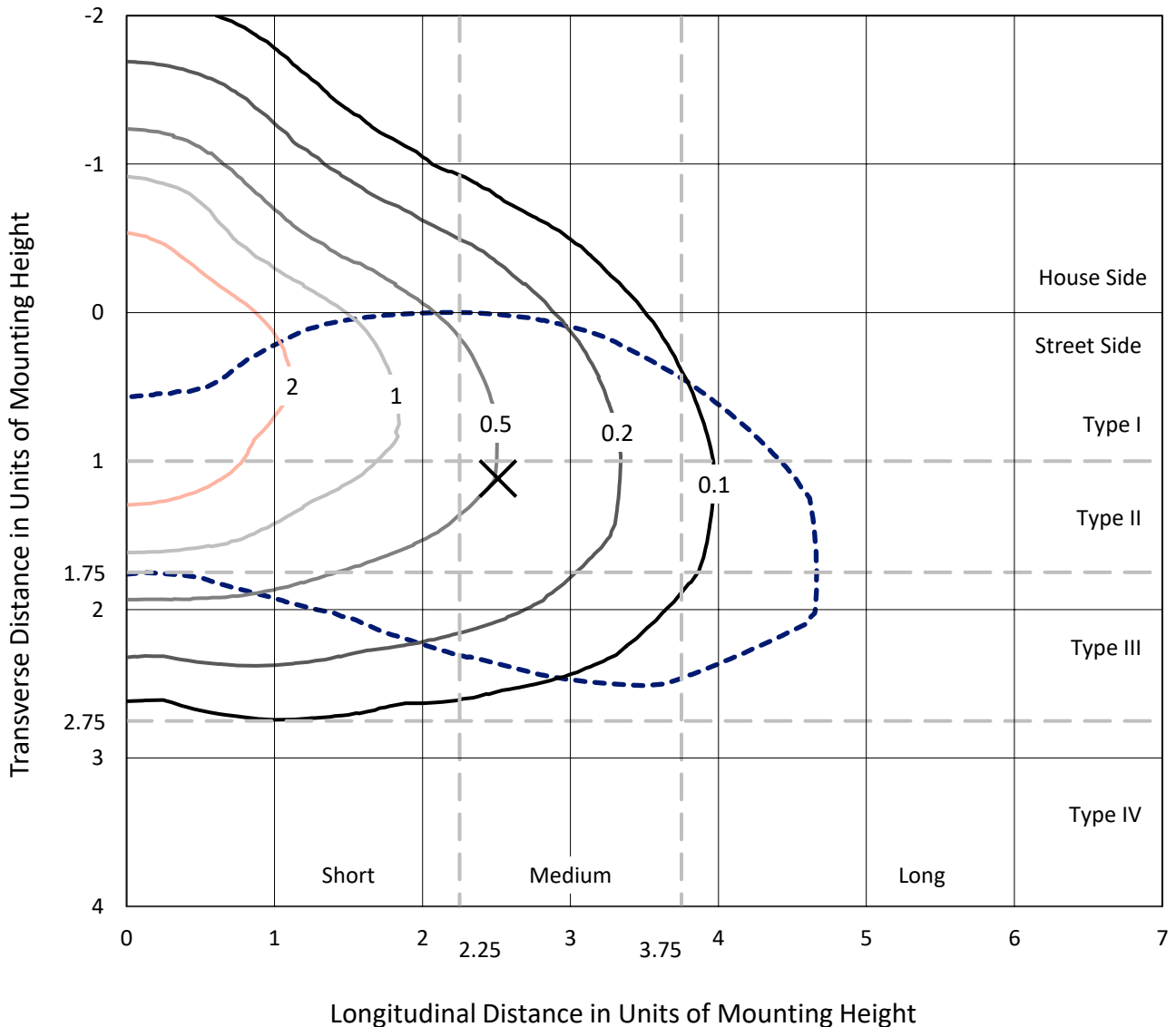
Lumens per Lamp: N/A  
Luminaire Lumens: 9250.7 lumens  
Efficiency: N/A  
Efficacy: 151.7 lumens/watt  
Luminous Opening: Rectangular (W 0.67' x L: 0.33' x H: 0')  
IES Classification: Type III - Medium  
BUG Rating: B2 - U0 - G2

Input Watts (W): 61  
Input Voltage (V): 120  
Input Current (A<sub>in</sub>): NR  
Voltage Rise (V): NR  
Power Factor: 0.99  
Total Harmonic Distortion (THDi): 9.89%  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

REPORT NUMBER: P868545  
 CATALOG NUMBER: EMM2-HTN-SA2A-750-U-T3

### Iso-Footcandle Lines of Horizontal Illumination

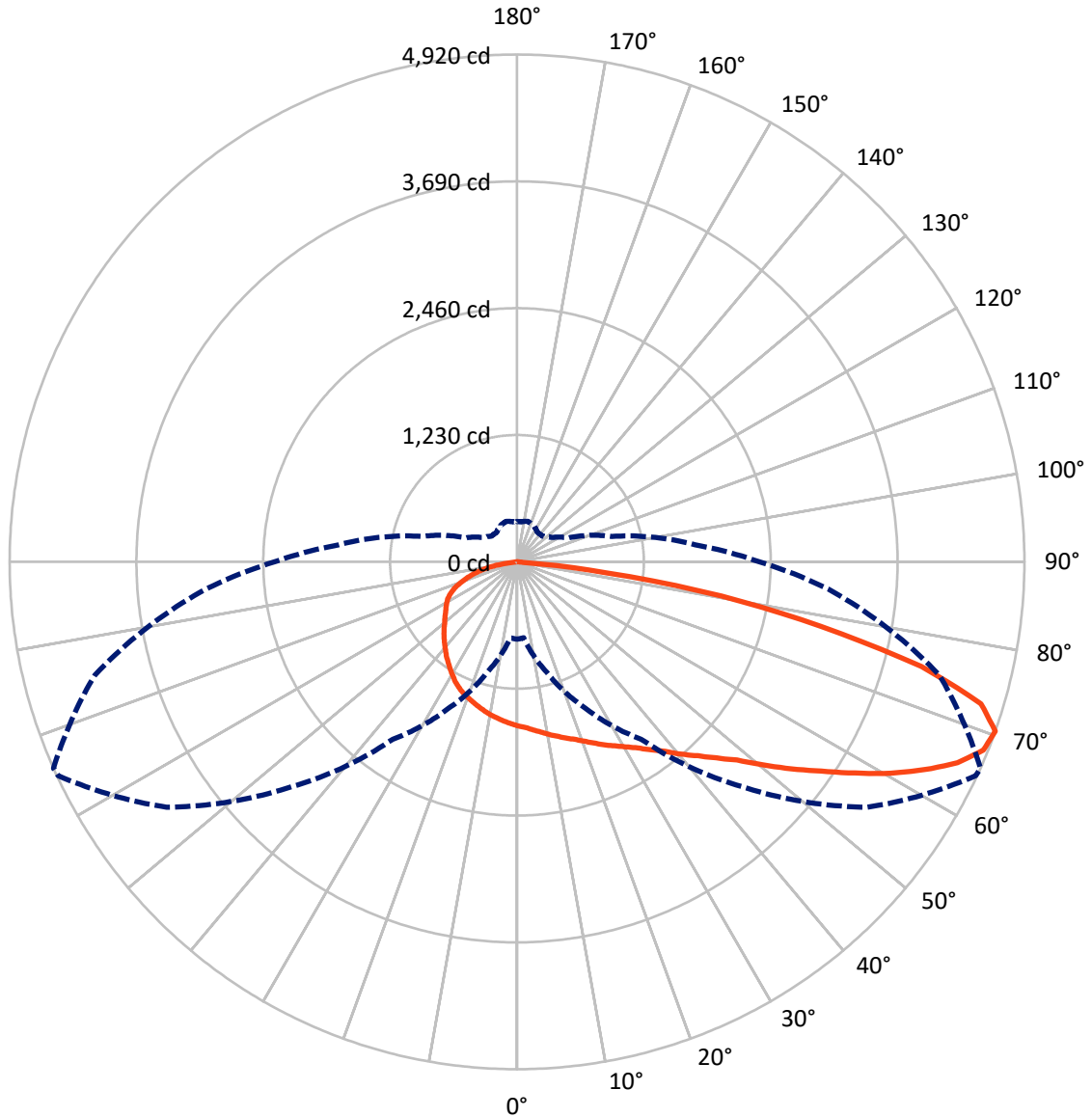
× Max cd  
 - - - 1/2 Max cd



Based on 20 foot mounting height. Maximum calculated value = 4.3 fc  
 Type III - Medium - N/A

REPORT NUMBER: P868545  
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### Luminous Intensity Polar Plot



— Vertical Plane Through 66-Deg Lateral      - - - Horizontal Cone Through 70-Deg Vertical

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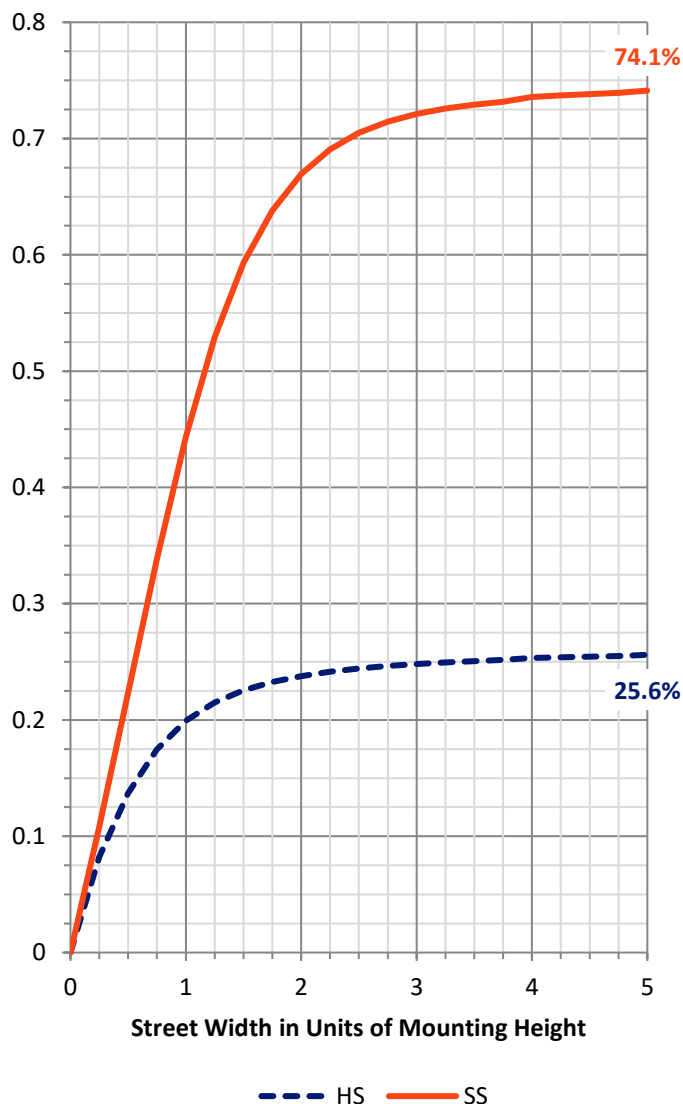
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 2384.0   | 0.0    | 2384.0 |
|                    | % Fixture | 25.8     | 0.0    | 25.8   |
| <b>Street Side</b> | Lumens    | 6866.8   | 0.0    | 6866.8 |
|                    | % Fixture | 74.2     | 0.0    | 74.2   |
| <b>Total</b>       | Lumens    | 9250.7   | 0.0    | 9250.7 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 152.3  | 1.6       |
| 10°-20°   | 453.7  | 4.9       |
| 20°-30°   | 762.1  | 8.2       |
| 30°-40°   | 1148.1 | 12.4      |
| 40°-50°   | 1558.7 | 16.8      |
| 50°-60°   | 1852.2 | 20.0      |
| 60°-70°   | 1890.3 | 20.4      |
| 70°-80°   | 1264.3 | 13.7      |
| 80°-90°   | 169.1  | 1.8       |
| 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°    | 9250.7 | 100.0     |
| 0°-180°   | 9250.7 | 100.0     |

**Coefficient of Utilization**



REPORT NUMBER: P868545

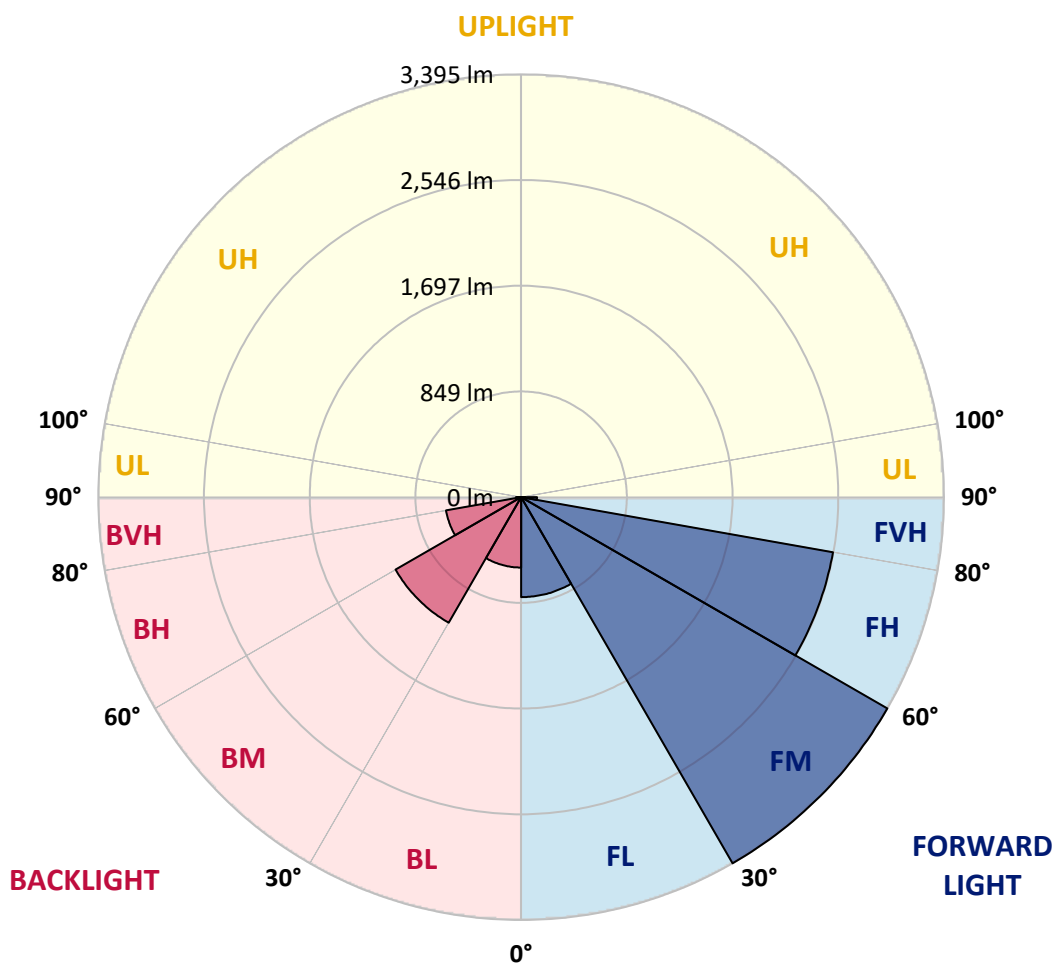
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**LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:**

| Zone           | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|----------------|--------|-----------|-------------------------|------|---------|
|                |        |           | B                       | U    | G       |
| FL (0°-30°)    | 802.8  | 8.7       |                         |      |         |
| FM (30°-60°)   | 3394.8 | 36.7      |                         |      |         |
| FH (60°-80°)   | 2542.4 | 27.5      |                         |      | G2/5000 |
| FVH (80°-90°)  | 126.7  | 1.4       |                         |      | G2/225  |
| BL (0°-30°)    | 565.3  | 6.1       | B2/1000                 |      |         |
| BM (30°-60°)   | 1164.1 | 12.6      | B2/2500                 |      |         |
| BH (60°-80°)   | 612.1  | 6.6       | B2/1000                 |      | G2/1000 |
| BVH (80°-90°)  | 42.5   | 0.5       |                         |      | 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 III Medium





REPORT NUMBER: P868545

CATALOG NUMBER: EMM2-HTN-SA2A-750-U-T3

**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 65°    | 66°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1591.6 | 1591.6 | 1591.6 | 1591.6 | 1591.6 | 1591.6 | 1591.6 | 1591.6 | 1591.6 | 1591.6 | 1591.6 |
| 2.5°  | 1648.6 | 1641.3 | 1635.7 | 1639.4 | 1628.4 | 1632.1 | 1619.2 | 1610.0 | 1608.2 | 1604.5 | 1600.8 |
| 5°    | 1700.1 | 1700.1 | 1690.9 | 1690.9 | 1678.0 | 1676.2 | 1657.8 | 1637.6 | 1637.6 | 1624.7 | 1610.0 |
| 7.5°  | 1755.2 | 1751.5 | 1740.5 | 1738.7 | 1724.0 | 1720.3 | 1700.1 | 1668.8 | 1667.0 | 1643.1 | 1621.0 |
| 10°   | 1793.8 | 1795.6 | 1788.3 | 1788.3 | 1777.3 | 1768.1 | 1738.7 | 1705.6 | 1701.9 | 1670.7 | 1635.7 |
| 12.5° | 1823.2 | 1826.9 | 1825.1 | 1825.1 | 1815.9 | 1815.9 | 1782.8 | 1738.7 | 1735.0 | 1694.6 | 1644.9 |
| 15°   | 1854.5 | 1852.6 | 1858.1 | 1860.0 | 1856.3 | 1850.8 | 1826.9 | 1775.4 | 1773.6 | 1720.3 | 1657.8 |
| 17.5° | 1882.0 | 1880.2 | 1882.0 | 1891.2 | 1893.1 | 1893.1 | 1869.2 | 1815.9 | 1808.5 | 1751.5 | 1668.8 |
| 20°   | 1898.6 | 1902.2 | 1909.6 | 1920.6 | 1926.1 | 1940.8 | 1920.6 | 1863.7 | 1856.3 | 1784.6 | 1692.7 |
| 22.5° | 1961.1 | 1950.0 | 1955.5 | 1962.9 | 1970.3 | 1990.5 | 1972.1 | 1913.3 | 1907.8 | 1834.2 | 1720.3 |
| 25°   | 2067.7 | 2067.7 | 2054.8 | 2041.9 | 2032.7 | 2041.9 | 2027.2 | 1970.3 | 1966.6 | 1878.4 | 1751.5 |
| 27.5° | 2253.3 | 2253.3 | 2225.7 | 2177.9 | 2117.3 | 2100.7 | 2089.7 | 2030.9 | 2019.9 | 1926.1 | 1771.8 |
| 30°   | 2488.5 | 2495.9 | 2446.3 | 2365.4 | 2253.3 | 2179.8 | 2152.2 | 2087.9 | 2082.4 | 1973.9 | 1803.0 |
| 32.5° | 2740.3 | 2755.0 | 2718.3 | 2600.7 | 2416.9 | 2273.5 | 2229.4 | 2163.2 | 2150.4 | 2030.9 | 1843.4 |
| 35°   | 2966.4 | 2981.1 | 2931.5 | 2821.2 | 2586.0 | 2409.5 | 2321.3 | 2245.9 | 2238.6 | 2104.4 | 1904.1 |
| 37.5° | 3150.2 | 3153.9 | 3122.6 | 2988.5 | 2727.5 | 2523.5 | 2435.2 | 2345.2 | 2330.5 | 2192.6 | 1968.4 |
| 40°   | 3345.0 | 3359.7 | 3328.5 | 3163.1 | 2856.1 | 2646.6 | 2549.2 | 2464.7 | 2451.8 | 2284.5 | 2029.1 |
| 42.5° | 3549.0 | 3547.2 | 3547.2 | 3313.8 | 2984.8 | 2749.5 | 2672.3 | 2578.6 | 2571.3 | 2378.3 | 2095.2 |
| 45°   | 3674.0 | 3681.4 | 3661.1 | 3403.8 | 3174.1 | 2856.1 | 2791.8 | 2723.8 | 2710.9 | 2508.8 | 2181.6 |
| 47.5° | 3705.2 | 3688.7 | 3596.8 | 3473.7 | 3387.3 | 2966.4 | 2942.5 | 2902.1 | 2872.7 | 2652.1 | 2288.2 |
| 50°   | 3663.0 | 3637.2 | 3583.9 | 3504.9 | 3466.3 | 3098.7 | 3095.1 | 3115.3 | 3095.1 | 2826.7 | 2411.4 |
| 52.5° | 3504.9 | 3501.2 | 3492.0 | 3510.4 | 3447.9 | 3203.5 | 3267.8 | 3337.7 | 3334.0 | 3005.0 | 2540.0 |
| 55°   | 3172.3 | 3196.1 | 3306.4 | 3422.2 | 3378.1 | 3275.2 | 3460.8 | 3595.0 | 3580.3 | 3214.5 | 2672.3 |
| 57.5° | 2832.2 | 2856.1 | 2997.6 | 3273.3 | 3310.1 | 3352.4 | 3677.7 | 3887.2 | 3863.3 | 3442.4 | 2793.6 |
| 60°   | 2536.3 | 2510.6 | 2652.1 | 3049.1 | 3214.5 | 3422.2 | 3892.7 | 4183.1 | 4162.9 | 3670.3 | 2918.6 |
| 62.5° | 2067.7 | 2093.4 | 2319.5 | 2722.0 | 3080.4 | 3466.3 | 4069.2 | 4451.4 | 4438.6 | 3879.8 | 3019.7 |
| 65°   | 1635.7 | 1600.8 | 1940.8 | 2378.3 | 2848.8 | 3451.6 | 4221.7 | 4703.2 | 4694.0 | 4085.7 | 3096.9 |
| 67.5° | 1111.9 | 1088.0 | 1536.5 | 2036.4 | 2534.5 | 3334.0 | 4256.6 | 4872.3 | 4876.0 | 4207.0 | 3117.1 |
| 70°   | 749.9  | 738.8  | 1104.6 | 1565.9 | 2098.9 | 3080.4 | 4148.2 | 4907.2 | 4920.1 | 4238.2 | 3027.1 |
| 72.5° | 553.2  | 551.4  | 808.7  | 1117.5 | 1562.2 | 2600.7 | 3852.3 | 4679.3 | 4703.2 | 4017.7 | 2762.4 |
| 75°   | 435.6  | 441.1  | 577.1  | 794.0  | 1042.1 | 1924.3 | 3240.3 | 4012.2 | 4048.9 | 3470.0 | 2293.7 |
| 77.5° | 356.6  | 356.6  | 404.3  | 569.8  | 696.6  | 1194.6 | 2330.5 | 2937.0 | 3010.5 | 2677.8 | 1766.2 |
| 80°   | 288.6  | 294.1  | 299.6  | 397.0  | 461.3  | 681.9  | 1356.4 | 1959.2 | 2012.5 | 1865.5 | 1275.5 |
| 82.5° | 158.1  | 169.1  | 163.6  | 205.8  | 231.6  | 316.1  | 538.5  | 792.1  | 873.0  | 777.4  | 578.9  |
| 85°   | 11.0   | 7.4    | 12.9   | 16.5   | 20.2   | 31.2   | 42.3   | 58.8   | 55.1   | 79.0   | 40.4   |
| 87.5° | 1.8    | 1.8    | 1.8    | 3.7    | 3.7    | 5.5    | 7.4    | 7.4    | 7.4    | 7.4    | 7.4    |
| 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: P868545

CATALOG NUMBER: EMM2-HTN-SA2A-750-U-T3

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1591.6 | 1591.6 | 1591.6 | 1591.6 | 1591.6 | 1591.6 | 1591.6 | 1591.6 | 1591.6 | 1591.6 | 1591.6 |
| 2.5°  | 1599.0 | 1589.8 | 1575.1 | 1571.4 | 1565.9 | 1558.6 | 1551.2 | 1540.2 | 1536.5 | 1540.2 | 1543.9 |
| 5°    | 1600.8 | 1588.0 | 1564.1 | 1549.4 | 1534.7 | 1521.8 | 1507.1 | 1492.4 | 1483.2 | 1485.0 | 1492.4 |
| 7.5°  | 1606.3 | 1588.0 | 1551.2 | 1527.3 | 1503.4 | 1483.2 | 1459.3 | 1442.8 | 1431.7 | 1433.6 | 1439.1 |
| 10°   | 1613.7 | 1588.0 | 1543.9 | 1503.4 | 1470.3 | 1440.9 | 1417.0 | 1396.8 | 1385.8 | 1384.0 | 1385.8 |
| 12.5° | 1615.5 | 1586.1 | 1527.3 | 1477.7 | 1437.3 | 1398.7 | 1372.9 | 1354.5 | 1343.5 | 1338.0 | 1341.7 |
| 15°   | 1621.0 | 1580.6 | 1510.8 | 1450.1 | 1400.5 | 1360.1 | 1328.8 | 1306.8 | 1299.4 | 1295.7 | 1293.9 |
| 17.5° | 1628.4 | 1578.8 | 1496.1 | 1422.6 | 1363.7 | 1317.8 | 1290.2 | 1268.2 | 1259.0 | 1255.3 | 1259.0 |
| 20°   | 1639.4 | 1580.6 | 1479.5 | 1395.0 | 1330.7 | 1284.7 | 1253.5 | 1231.4 | 1224.1 | 1222.2 | 1220.4 |
| 22.5° | 1654.1 | 1584.3 | 1466.7 | 1369.3 | 1293.9 | 1247.9 | 1216.7 | 1202.0 | 1196.5 | 1198.3 | 1198.3 |
| 25°   | 1668.8 | 1588.0 | 1448.3 | 1334.3 | 1255.3 | 1207.5 | 1185.5 | 1174.4 | 1178.1 | 1185.5 | 1185.5 |
| 27.5° | 1681.7 | 1586.1 | 1422.6 | 1297.6 | 1209.4 | 1165.2 | 1148.7 | 1150.5 | 1159.7 | 1172.6 | 1174.4 |
| 30°   | 1698.2 | 1586.1 | 1395.0 | 1251.6 | 1157.9 | 1115.6 | 1111.9 | 1126.6 | 1141.3 | 1154.2 | 1154.2 |
| 32.5° | 1724.0 | 1597.2 | 1372.9 | 1205.7 | 1104.6 | 1071.5 | 1088.0 | 1108.3 | 1124.8 | 1137.7 | 1141.3 |
| 35°   | 1768.1 | 1621.0 | 1358.2 | 1159.7 | 1053.1 | 1029.2 | 1060.5 | 1093.6 | 1104.6 | 1113.8 | 1115.6 |
| 37.5° | 1810.4 | 1643.1 | 1339.8 | 1115.6 | 999.8  | 990.6  | 1032.9 | 1067.8 | 1069.7 | 1075.2 | 1075.2 |
| 40°   | 1850.8 | 1659.6 | 1316.0 | 1067.8 | 948.4  | 948.4  | 998.0  | 1027.4 | 1023.7 | 1018.2 | 1020.0 |
| 42.5° | 1894.9 | 1668.8 | 1288.4 | 1023.7 | 906.1  | 906.1  | 946.5  | 972.3  | 970.4  | 977.8  | 983.3  |
| 45°   | 1948.2 | 1687.2 | 1251.6 | 983.3  | 862.0  | 854.6  | 887.7  | 909.8  | 937.3  | 970.4  | 979.6  |
| 47.5° | 2021.7 | 1712.9 | 1222.2 | 939.2  | 825.2  | 799.5  | 812.4  | 858.3  | 889.6  | 917.1  | 920.8  |
| 50°   | 2098.9 | 1749.7 | 1196.5 | 893.2  | 781.1  | 735.2  | 746.2  | 797.7  | 816.0  | 827.1  | 832.6  |
| 52.5° | 2181.6 | 1779.1 | 1174.4 | 854.6  | 735.2  | 669.0  | 683.7  | 733.3  | 746.2  | 755.4  | 757.2  |
| 55°   | 2253.3 | 1803.0 | 1146.9 | 817.9  | 685.5  | 606.5  | 624.9  | 672.7  | 685.5  | 696.6  | 696.6  |
| 57.5° | 2328.6 | 1825.1 | 1128.5 | 786.6  | 632.2  | 555.1  | 567.9  | 615.7  | 634.1  | 637.8  | 643.3  |
| 60°   | 2391.1 | 1845.3 | 1111.9 | 757.2  | 582.6  | 509.1  | 518.3  | 560.6  | 582.6  | 584.5  | 588.1  |
| 62.5° | 2435.2 | 1858.1 | 1102.8 | 720.5  | 533.0  | 463.2  | 470.5  | 512.8  | 538.5  | 544.0  | 545.9  |
| 65°   | 2462.8 | 1865.5 | 1086.2 | 672.7  | 490.7  | 424.6  | 424.6  | 466.8  | 492.6  | 505.4  | 509.1  |
| 67.5° | 2449.9 | 1852.6 | 1042.1 | 617.5  | 452.1  | 386.0  | 384.1  | 426.4  | 448.5  | 455.8  | 457.6  |
| 70°   | 2350.7 | 1777.3 | 952.0  | 549.5  | 411.7  | 351.0  | 347.4  | 386.0  | 406.2  | 389.6  | 391.5  |
| 72.5° | 2148.5 | 1606.3 | 828.9  | 481.5  | 369.4  | 318.0  | 314.3  | 347.4  | 349.2  | 349.2  | 347.4  |
| 75°   | 1810.4 | 1312.3 | 661.7  | 409.9  | 325.3  | 283.0  | 284.9  | 310.6  | 312.4  | 321.6  | 316.1  |
| 77.5° | 1387.6 | 972.3  | 516.5  | 327.1  | 275.7  | 251.8  | 261.0  | 270.2  | 283.0  | 295.9  | 283.0  |
| 80°   | 1009.0 | 670.8  | 358.4  | 244.4  | 213.2  | 213.2  | 216.9  | 226.1  | 244.4  | 257.3  | 244.4  |
| 82.5° | 431.9  | 295.9  | 165.4  | 121.3  | 104.8  | 102.9  | 104.8  | 104.8  | 128.7  | 132.3  | 115.8  |
| 85°   | 33.1   | 27.6   | 20.2   | 20.2   | 16.5   | 9.2    | 9.2    | 7.4    | 5.5    | 5.5    | 5.5    |
| 87.5° | 7.4    | 5.5    | 5.5    | 5.5    | 3.7    | 3.7    | 3.7    | 3.7    | 3.7    | 3.7    | 3.7    |
| 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: SP1-2407-157-6

Test Date: 08/07/2024

Luminaire Tested: MEM2-HTN-SA-40-750-U-5WQ-2

Data in this report applies to families of products including MEM2-HTN-SA-40-750-U-5WQ-2

**Test Information**

Test Method: LM-79-2019  
 Report Number: SP1-2407-157-6  
 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-40-750-U-5WQ-2**  
 Description: Epic Modern Light Square 40W 5WQ Optic and Flare Trim

**Spectral Parameters**

CCT (K): 5094  
 CIE u': 0.2082  
 CIE v': 0.4867  
 Duv: 0.0032  
 CIE x: 0.3430  
 CIE y: 0.3564  
 CIE z: 0.3006  
 Peak Wavelength (nm): 451  
 Dominant Wavelength (nm): 568  
 Purity: 9.86439  
 Rf: 73.7  
 Rg: 93

|           |      |      |       |
|-----------|------|------|-------|
| CRI (Ra): | 72.0 |      |       |
| R1:       | 68.6 | R9:  | -39.6 |
| R2:       | 78.1 | R10: | 47.6  |
| R3:       | 84.6 | R11: | 68.2  |
| R4:       | 71.6 | R12: | 41.4  |
| R5:       | 69.6 | R13: | 70.4  |
| R6:       | 69.4 | R14: | 91.4  |
| R7:       | 80.9 | R15: | 61.4  |
| R8:       | 53.1 |      |       |



**Test Conditions**

Stabilization Time: 20M  
 Operation Time: 1H 20M  
 Sphere Temperature (°C): 24.2

REPORT NUMBER: SP1-2407-157-6

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

REPORT NUMBER: SP1-2407-157-6

**CIE 1931 Chromaticity Diagram**



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



Point lies inside the ANSI 5000K 4-step quadrangle

REPORT NUMBER: SP1-2407-157-6

**Photopic Flux vs. Wavelength**



**Photopic Lumens: NR**

| λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) |
|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|
| 360    | 0                        | NR            | 490    | 114                      | NR            | 620    | 361                      | NR            | 750    | 9                        | NR            | 880    | 0                        | NR            |
| 365    | 0                        | NR            | 495    | 145                      | NR            | 625    | 326                      | NR            | 755    | 8                        | NR            | 885    | 0                        | NR            |
| 370    | 0                        | NR            | 500    | 197                      | NR            | 630    | 294                      | NR            | 760    | 7                        | NR            | 890    | 0                        | NR            |
| 375    | 0                        | NR            | 505    | 259                      | NR            | 635    | 261                      | NR            | 765    | 6                        | NR            | 895    | 0                        | NR            |
| 380    | 0                        | NR            | 510    | 319                      | NR            | 640    | 232                      | NR            | 770    | 5                        | NR            | 900    | 0                        | NR            |
| 385    | 0                        | NR            | 515    | 373                      | NR            | 645    | 204                      | NR            | 775    | 4                        | NR            | 905    | 0                        | NR            |
| 390    | 0                        | NR            | 520    | 414                      | NR            | 650    | 179                      | NR            | 780    | 4                        | NR            | 910    | 0                        | NR            |
| 395    | 1                        | NR            | 525    | 445                      | NR            | 655    | 157                      | NR            | 785    | 3                        | NR            | 915    | 0                        | NR            |
| 400    | 3                        | NR            | 530    | 465                      | NR            | 660    | 136                      | NR            | 790    | 3                        | NR            | 920    | 0                        | NR            |
| 405    | 5                        | NR            | 535    | 482                      | NR            | 665    | 118                      | NR            | 795    | 2                        | NR            | 925    | 0                        | NR            |
| 410    | 9                        | NR            | 540    | 493                      | NR            | 670    | 102                      | NR            | 800    | 2                        | NR            | 930    | 0                        | NR            |
| 415    | 18                       | NR            | 545    | 505                      | NR            | 675    | 87                       | NR            | 805    | 2                        | NR            | 935    | 0                        | NR            |
| 420    | 36                       | NR            | 550    | 515                      | NR            | 680    | 75                       | NR            | 810    | 2                        | NR            | 940    | 0                        | NR            |
| 425    | 72                       | NR            | 555    | 527                      | NR            | 685    | 65                       | NR            | 815    | 1                        | NR            | 945    | 0                        | NR            |
| 430    | 134                      | NR            | 560    | 540                      | NR            | 690    | 56                       | NR            | 820    | 1                        | NR            | 950    | 0                        | NR            |
| 435    | 242                      | NR            | 565    | 550                      | NR            | 695    | 48                       | NR            | 825    | 1                        | NR            | 955    | 0                        | NR            |
| 440    | 407                      | NR            | 570    | 557                      | NR            | 700    | 41                       | NR            | 830    | 1                        | NR            | 960    | 0                        | NR            |
| 445    | 684                      | NR            | 575    | 561                      | NR            | 705    | 35                       | NR            | 835    | 1                        | NR            | 965    | 0                        | NR            |
| 450    | 988                      | NR            | 580    | 559                      | NR            | 710    | 30                       | NR            | 840    | 1                        | NR            | 970    | 0                        | NR            |
| 455    | 828                      | NR            | 585    | 551                      | NR            | 715    | 26                       | NR            | 845    | 1                        | NR            | 975    | 0                        | NR            |
| 460    | 473                      | NR            | 590    | 537                      | NR            | 720    | 22                       | NR            | 850    | 1                        | NR            | 980    | 0                        | NR            |
| 465    | 333                      | NR            | 595    | 516                      | NR            | 725    | 19                       | NR            | 855    | 0                        | NR            | 985    | 0                        | NR            |
| 470    | 232                      | NR            | 600    | 491                      | NR            | 730    | 16                       | NR            | 860    | 0                        | NR            | 990    | 0                        | NR            |
| 475    | 146                      | NR            | 605    | 461                      | NR            | 735    | 14                       | NR            | 865    | 0                        | NR            | 995    | 0                        | NR            |
| 480    | 113                      | NR            | 610    | 429                      | NR            | 740    | 12                       | NR            | 870    | 0                        | NR            | 1000   | 0                        | NR            |
| 485    | 106                      | NR            | 615    | 395                      | NR            | 745    | 10                       | NR            | 875    | 0                        | NR            |        |                          |               |

REPORT NUMBER: SP1-2407-157-6

**Scotopic Flux vs. Wavelength**



**Scotopic Lumens: NR**

**S/P: 1.81**

| 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    | 114                      | NR            | 620    | 361                      | NR            | 750    | 9                        | NR            | 880    | 0                        | NR            |
| 365    | 0                        | NR            | 495    | 145                      | NR            | 625    | 326                      | NR            | 755    | 8                        | NR            | 885    | 0                        | NR            |
| 370    | 0                        | NR            | 500    | 197                      | NR            | 630    | 294                      | NR            | 760    | 7                        | NR            | 890    | 0                        | NR            |
| 375    | 0                        | NR            | 505    | 259                      | NR            | 635    | 261                      | NR            | 765    | 6                        | NR            | 895    | 0                        | NR            |
| 380    | 0                        | NR            | 510    | 319                      | NR            | 640    | 232                      | NR            | 770    | 5                        | NR            | 900    | 0                        | NR            |
| 385    | 0                        | NR            | 515    | 373                      | NR            | 645    | 204                      | NR            | 775    | 4                        | NR            | 905    | 0                        | NR            |
| 390    | 0                        | NR            | 520    | 414                      | NR            | 650    | 179                      | NR            | 780    | 4                        | NR            | 910    | 0                        | NR            |
| 395    | 1                        | NR            | 525    | 445                      | NR            | 655    | 157                      | NR            | 785    | 3                        | NR            | 915    | 0                        | NR            |
| 400    | 3                        | NR            | 530    | 465                      | NR            | 660    | 136                      | NR            | 790    | 3                        | NR            | 920    | 0                        | NR            |
| 405    | 5                        | NR            | 535    | 482                      | NR            | 665    | 118                      | NR            | 795    | 2                        | NR            | 925    | 0                        | NR            |
| 410    | 9                        | NR            | 540    | 493                      | NR            | 670    | 102                      | NR            | 800    | 2                        | NR            | 930    | 0                        | NR            |
| 415    | 18                       | NR            | 545    | 505                      | NR            | 675    | 87                       | NR            | 805    | 2                        | NR            | 935    | 0                        | NR            |
| 420    | 36                       | NR            | 550    | 515                      | NR            | 680    | 75                       | NR            | 810    | 2                        | NR            | 940    | 0                        | NR            |
| 425    | 72                       | NR            | 555    | 527                      | NR            | 685    | 65                       | NR            | 815    | 1                        | NR            | 945    | 0                        | NR            |
| 430    | 134                      | NR            | 560    | 540                      | NR            | 690    | 56                       | NR            | 820    | 1                        | NR            | 950    | 0                        | NR            |
| 435    | 242                      | NR            | 565    | 550                      | NR            | 695    | 48                       | NR            | 825    | 1                        | NR            | 955    | 0                        | NR            |
| 440    | 407                      | NR            | 570    | 557                      | NR            | 700    | 41                       | NR            | 830    | 1                        | NR            | 960    | 0                        | NR            |
| 445    | 684                      | NR            | 575    | 561                      | NR            | 705    | 35                       | NR            | 835    | 1                        | NR            | 965    | 0                        | NR            |
| 450    | 988                      | NR            | 580    | 559                      | NR            | 710    | 30                       | NR            | 840    | 1                        | NR            | 970    | 0                        | NR            |
| 455    | 828                      | NR            | 585    | 551                      | NR            | 715    | 26                       | NR            | 845    | 1                        | NR            | 975    | 0                        | NR            |
| 460    | 473                      | NR            | 590    | 537                      | NR            | 720    | 22                       | NR            | 850    | 1                        | NR            | 980    | 0                        | NR            |
| 465    | 333                      | NR            | 595    | 516                      | NR            | 725    | 19                       | NR            | 855    | 0                        | NR            | 985    | 0                        | NR            |
| 470    | 232                      | NR            | 600    | 491                      | NR            | 730    | 16                       | NR            | 860    | 0                        | NR            | 990    | 0                        | NR            |
| 475    | 146                      | NR            | 605    | 461                      | NR            | 735    | 14                       | NR            | 865    | 0                        | NR            | 995    | 0                        | NR            |
| 480    | 113                      | NR            | 610    | 429                      | NR            | 740    | 12                       | NR            | 870    | 0                        | NR            | 1000   | 0                        | NR            |
| 485    | 106                      | NR            | 615    | 395                      | NR            | 745    | 10                       | NR            | 875    | 0                        | NR            |        |                          |               |

REPORT NUMBER: SP1-2407-157-6

Melanopic Flux vs. Wavelength



Melanopic Lumens: NR

M/P: 3.73

| 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    | 114                      | NR            | 620    | 361                      | NR            | 750    | 9                        | NR            | 880    | 0                        | NR            |
| 365    | 0                        | NR            | 495    | 145                      | NR            | 625    | 326                      | NR            | 755    | 8                        | NR            | 885    | 0                        | NR            |
| 370    | 0                        | NR            | 500    | 197                      | NR            | 630    | 294                      | NR            | 760    | 7                        | NR            | 890    | 0                        | NR            |
| 375    | 0                        | NR            | 505    | 259                      | NR            | 635    | 261                      | NR            | 765    | 6                        | NR            | 895    | 0                        | NR            |
| 380    | 0                        | NR            | 510    | 319                      | NR            | 640    | 232                      | NR            | 770    | 5                        | NR            | 900    | 0                        | NR            |
| 385    | 0                        | NR            | 515    | 373                      | NR            | 645    | 204                      | NR            | 775    | 4                        | NR            | 905    | 0                        | NR            |
| 390    | 0                        | NR            | 520    | 414                      | NR            | 650    | 179                      | NR            | 780    | 4                        | NR            | 910    | 0                        | NR            |
| 395    | 1                        | NR            | 525    | 445                      | NR            | 655    | 157                      | NR            | 785    | 3                        | NR            | 915    | 0                        | NR            |
| 400    | 3                        | NR            | 530    | 465                      | NR            | 660    | 136                      | NR            | 790    | 3                        | NR            | 920    | 0                        | NR            |
| 405    | 5                        | NR            | 535    | 482                      | NR            | 665    | 118                      | NR            | 795    | 2                        | NR            | 925    | 0                        | NR            |
| 410    | 9                        | NR            | 540    | 493                      | NR            | 670    | 102                      | NR            | 800    | 2                        | NR            | 930    | 0                        | NR            |
| 415    | 18                       | NR            | 545    | 505                      | NR            | 675    | 87                       | NR            | 805    | 2                        | NR            | 935    | 0                        | NR            |
| 420    | 36                       | NR            | 550    | 515                      | NR            | 680    | 75                       | NR            | 810    | 2                        | NR            | 940    | 0                        | NR            |
| 425    | 72                       | NR            | 555    | 527                      | NR            | 685    | 65                       | NR            | 815    | 1                        | NR            | 945    | 0                        | NR            |
| 430    | 134                      | NR            | 560    | 540                      | NR            | 690    | 56                       | NR            | 820    | 1                        | NR            | 950    | 0                        | NR            |
| 435    | 242                      | NR            | 565    | 550                      | NR            | 695    | 48                       | NR            | 825    | 1                        | NR            | 955    | 0                        | NR            |
| 440    | 407                      | NR            | 570    | 557                      | NR            | 700    | 41                       | NR            | 830    | 1                        | NR            | 960    | 0                        | NR            |
| 445    | 684                      | NR            | 575    | 561                      | NR            | 705    | 35                       | NR            | 835    | 1                        | NR            | 965    | 0                        | NR            |
| 450    | 988                      | NR            | 580    | 559                      | NR            | 710    | 30                       | NR            | 840    | 1                        | NR            | 970    | 0                        | NR            |
| 455    | 828                      | NR            | 585    | 551                      | NR            | 715    | 26                       | NR            | 845    | 1                        | NR            | 975    | 0                        | NR            |
| 460    | 473                      | NR            | 590    | 537                      | NR            | 720    | 22                       | NR            | 850    | 1                        | NR            | 980    | 0                        | NR            |
| 465    | 333                      | NR            | 595    | 516                      | NR            | 725    | 19                       | NR            | 855    | 0                        | NR            | 985    | 0                        | NR            |
| 470    | 232                      | NR            | 600    | 491                      | NR            | 730    | 16                       | NR            | 860    | 0                        | NR            | 990    | 0                        | NR            |
| 475    | 146                      | NR            | 605    | 461                      | NR            | 735    | 14                       | NR            | 865    | 0                        | NR            | 995    | 0                        | NR            |
| 480    | 113                      | NR            | 610    | 429                      | NR            | 740    | 12                       | NR            | 870    | 0                        | NR            | 1000   | 0                        | NR            |
| 485    | 106                      | NR            | 615    | 395                      | NR            | 745    | 10                       | NR            | 875    | 0                        | NR            |        |                          |               |

**Summary**

$R_f = 73.7$   
 $R_g = 93$   
 $CIE R_a = 72.0$   
 $R_9 = -39.6$



**Color Vector Graphics**





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

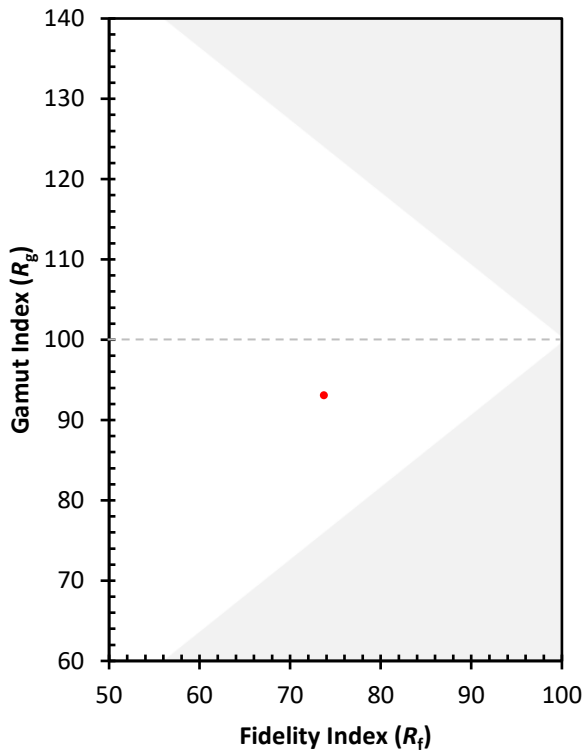
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 62 | CES51 = 90 | CES76 = 50 |
| CES02 = 59 | CES27 = 88 | CES52 = 89 | CES77 = 67 |
| CES03 = 30 | CES28 = 80 | CES53 = 79 | CES78 = 53 |
| CES04 = 69 | CES29 = 69 | CES54 = 84 | CES79 = 80 |
| CES05 = 46 | CES30 = 88 | CES55 = 83 | CES80 = 77 |
| CES06 = 50 | CES31 = 72 | CES56 = 74 | CES81 = 78 |
| CES07 = 38 | CES32 = 62 | CES57 = 73 | CES82 = 90 |
| CES08 = 38 | CES33 = 82 | CES58 = 73 | CES83 = 90 |
| CES09 = 29 | CES34 = 69 | CES59 = 86 | CES84 = 85 |
| CES10 = 72 | CES35 = 83 | CES60 = 88 | CES85 = 77 |
| CES11 = 56 | CES36 = 87 | CES61 = 82 | CES86 = 75 |
| CES12 = 61 | CES37 = 78 | CES62 = 81 | CES87 = 76 |
| CES13 = 41 | CES38 = 98 | CES63 = 73 | CES88 = 81 |
| CES14 = 74 | CES39 = 96 | CES64 = 63 | CES89 = 72 |
| CES15 = 70 | CES40 = 91 | CES65 = 60 | CES90 = 80 |
| CES16 = 46 | CES41 = 96 | CES66 = 56 | CES91 = 71 |
| CES17 = 49 | CES42 = 79 | CES67 = 53 | CES92 = 58 |
| CES18 = 55 | CES43 = 78 | CES68 = 63 | CES93 = 74 |
| CES19 = 71 | CES44 = 99 | CES69 = 72 | CES94 = 52 |
| CES20 = 63 | CES45 = 86 | CES70 = 55 | CES95 = 64 |
| CES21 = 85 | CES46 = 85 | CES71 = 46 | CES96 = 76 |
| CES22 = 77 | CES47 = 89 | CES72 = 82 | CES97 = 86 |
| CES23 = 91 | CES48 = 80 | CES73 = 45 | CES98 = 76 |
| CES24 = 90 | CES49 = 83 | CES74 = 90 | CES99 = 62 |
| CES25 = 71 | CES50 = 89 | CES75 = 48 |            |



Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)