

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

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Peachtree City, GA 30269

Scaled data based on original data using  
LM-79-2024 Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Test Report Prepared for  
Cooper Lighting Solutions

Brand: STREETWORKS

Report Number: P1461326

Luminaire Tested: USSL-70-740-U-T4W

Issue Date: 06/10/2026

**Test Information**

Test Method: LM-79-2024  
Report Number: P1461326  
Test Lab: INNOVATION CENTER(G3)  
Issue Date: 6/11/2026  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: STREETWORKS  
Catalog Number: USSL-70-740-U-T4W  
Description: USSL DISCRETE LED 1 SQUARE 70W 70CRI 4000K FIXTURE w/ TYPE IV WIDE DISTRIBUTION OPTIC  
Light Source: (40) 4000K CCT, 70 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 11634.8 lumens  
Efficiency: N/A  
Efficacy: 159.4 lumens/watt  
Luminous Opening: Rectangular (W 0.67' x L: 0.67' x H: 0')  
IES Classification: Type IV - Short  
BUG Rating: B2 - U0 - G2

Input Watts (W): 73  
Input Voltage (V): 120  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.98  
Total Harmonic Distortion (THDi): 2.73%  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 28.75 FT

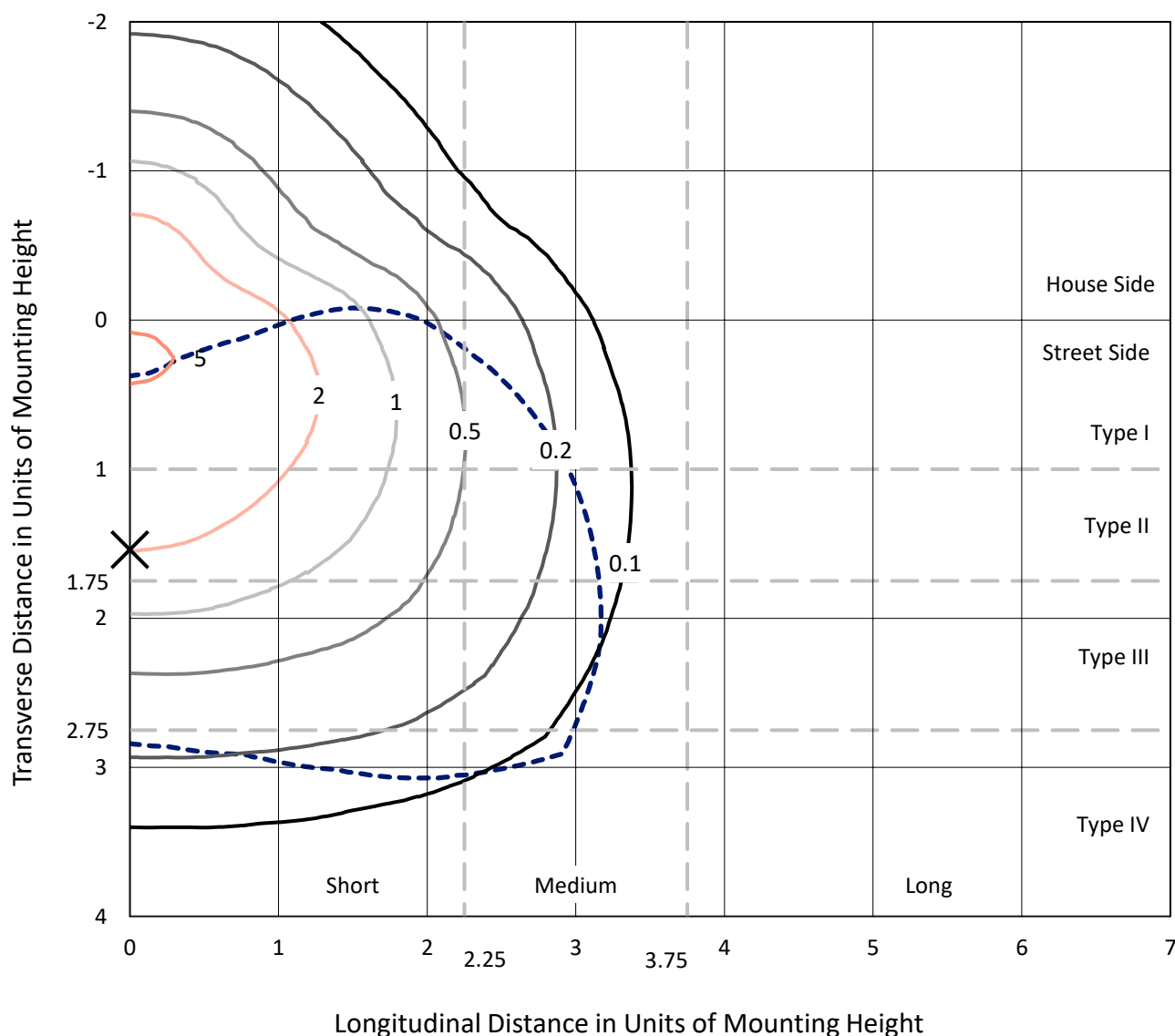
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## Iso-Footcandle Lines of Horizontal Illumination

× Max cd

--- 1/2 Max cd



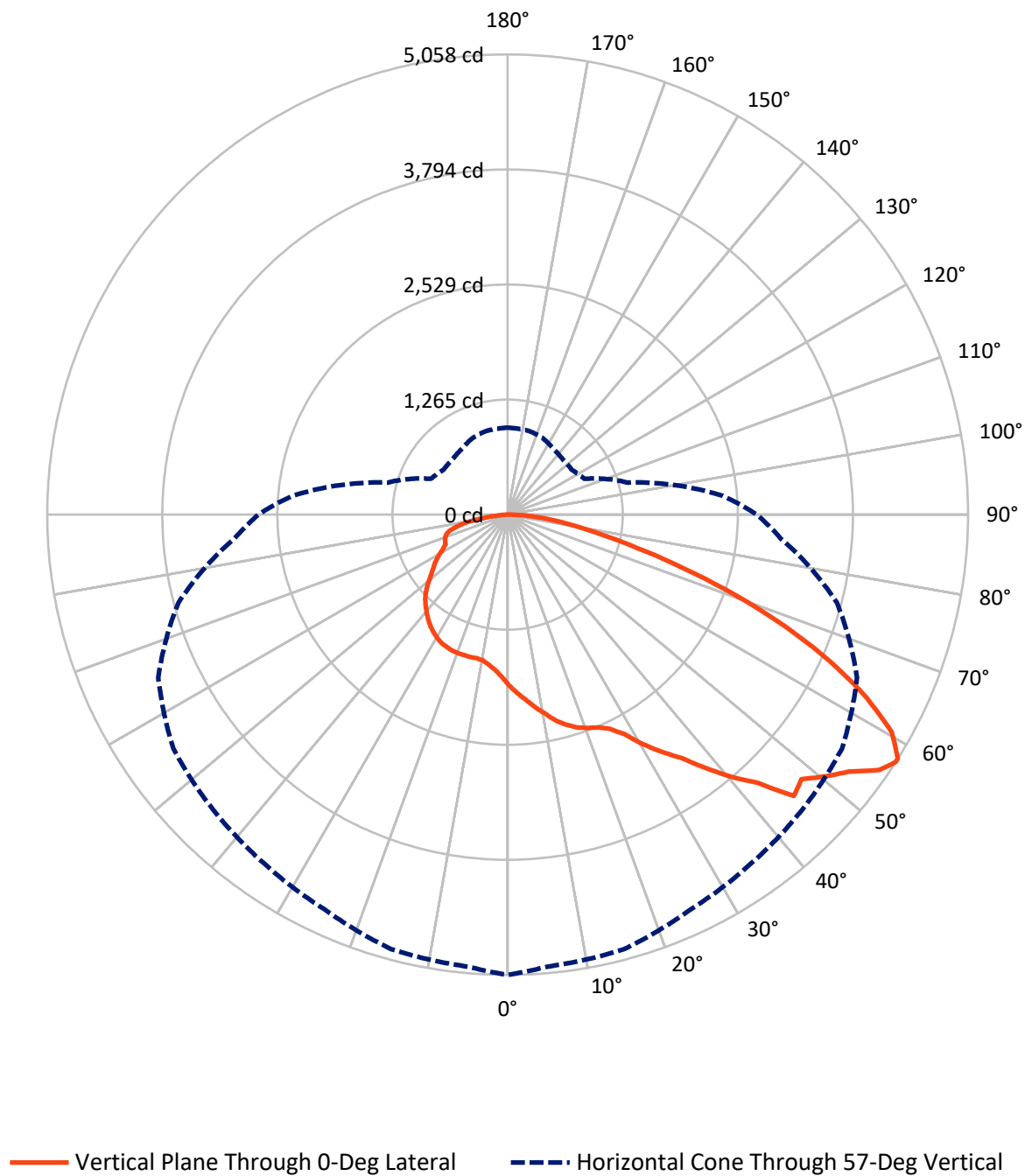
Based on 20 foot mounting height. Maximum calculated value = 5.4 fc

Type IV - Short - N/A

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CATALOG NUMBER: USSL-70-740-U-T4W

## Luminous Intensity Polar Plot



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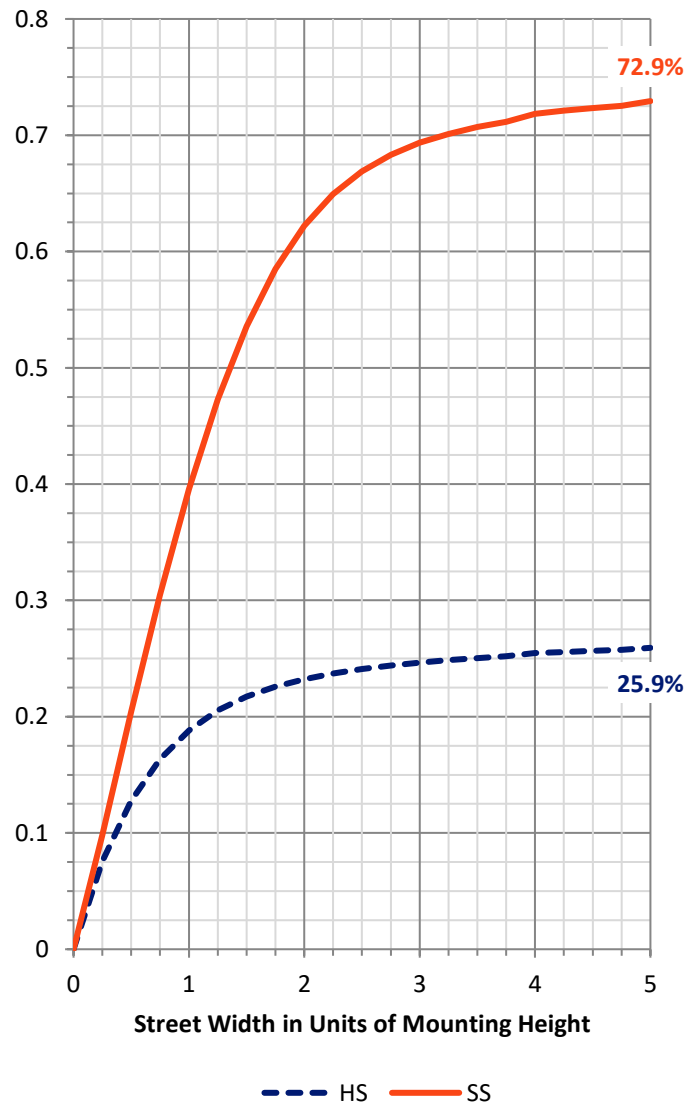
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 3067.7   | 0.0    | 3067.7  |
|                    | % Fixture | 26.4     | 0.0    | 26.4    |
| <b>Street Side</b> | Lumens    | 8567.1   | 0.0    | 8567.1  |
|                    | % Fixture | 73.6     | 0.0    | 73.6    |
| <b>Total</b>       | Lumens    | 11634.8  | 0.0    | 11634.8 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 179.8   | 1.5       |
| 10°-20°   | 554.4   | 4.8       |
| 20°-30°   | 949.9   | 8.2       |
| 30°-40°   | 1397.6  | 12.0      |
| 40°-50°   | 1923.2  | 16.5      |
| 50°-60°   | 2426.8  | 20.9      |
| 60°-70°   | 2459.1  | 21.1      |
| 70°-80°   | 1412.2  | 12.1      |
| 80°-90°   | 331.9   | 2.9       |
| 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°    | 11634.8 | 100.0     |
| 0°-180°   | 11634.8 | 100.0     |

**Coefficient of Utilization**



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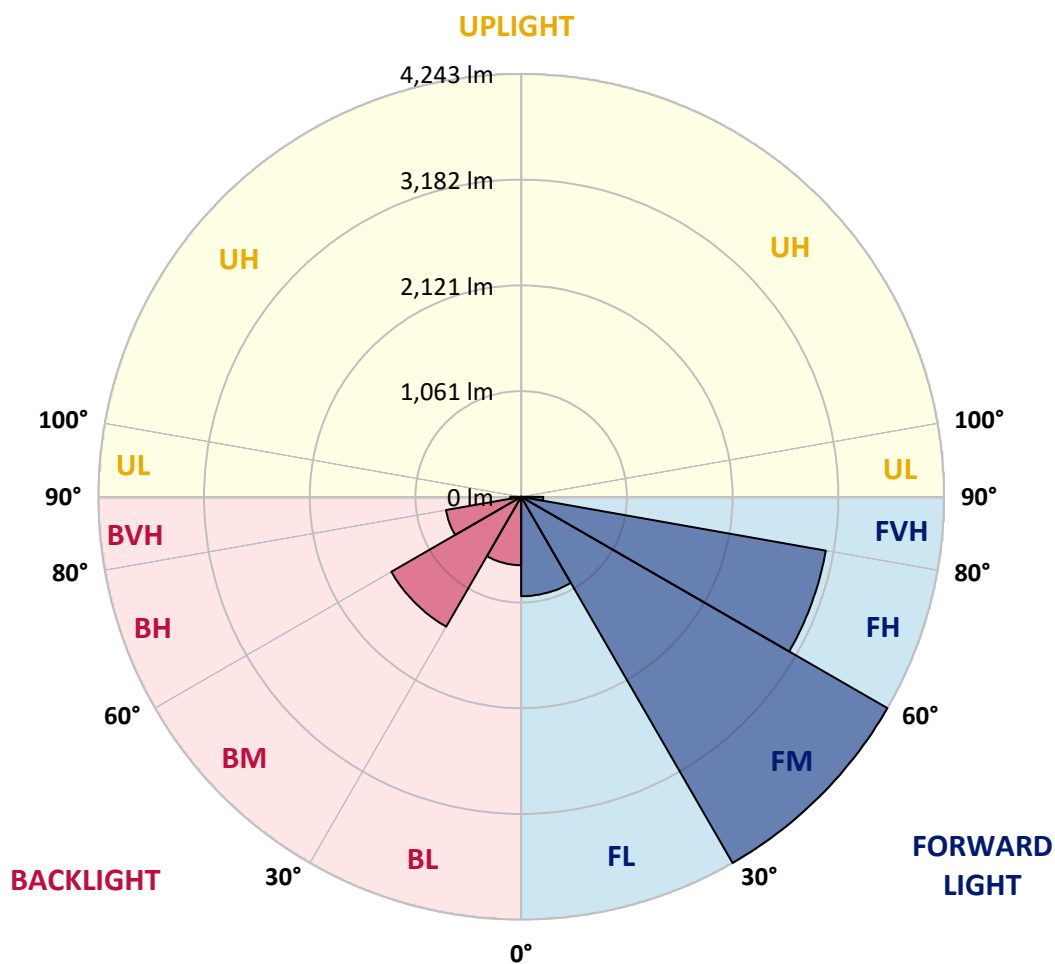
CATALOG NUMBER: USSL-70-740-U-T4W

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 997.3  | 8.6       |                         |      |         |
| FM   | (30°-60°)   | 4242.9 | 36.5      |                         |      |         |
| FH   | (60°-80°)   | 3104.8 | 26.7      |                         |      | G2/5000 |
| FVH  | (80°-90°)   | 222.1  | 1.9       |                         |      | G2/225  |
| BL   | (0°-30°)    | 686.8  | 5.9       | B2/1000                 |      |         |
| BM   | (30°-60°)   | 1504.7 | 12.9      | B2/2500                 |      |         |
| BH   | (60°-80°)   | 766.5  | 6.6       | B2/1000                 |      | G2/1000 |
| BVH  | (80°-90°)   | 109.7  | 0.9       |                         |      | G2/225  |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

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

Type IV Short



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 65°    | 75°    | 85°    | 90°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1875.2 | 1875.2 | 1875.2 | 1875.2 | 1875.2 | 1875.2 | 1875.2 | 1875.2 | 1875.2 | 1875.2 | 1875.2 |
| 2.5°  | 1961.1 | 1966.0 | 1961.6 | 1953.9 | 1941.8 | 1934.6 | 1930.8 | 1911.5 | 1899.4 | 1887.3 | 1876.3 |
| 5°    | 2040.3 | 2047.5 | 2045.8 | 2029.3 | 2017.2 | 2002.3 | 1978.7 | 1948.4 | 1922.0 | 1889.5 | 1873.0 |
| 7.5°  | 2132.8 | 2132.8 | 2120.7 | 2110.8 | 2083.8 | 2061.3 | 2031.0 | 1990.2 | 1945.6 | 1901.6 | 1873.5 |
| 10°   | 2219.3 | 2224.8 | 2215.4 | 2196.7 | 2164.8 | 2132.3 | 2089.3 | 2044.2 | 1980.9 | 1920.3 | 1886.2 |
| 12.5° | 2318.4 | 2318.4 | 2307.9 | 2278.7 | 2250.1 | 2204.4 | 2153.2 | 2093.2 | 2026.0 | 1947.3 | 1903.8 |
| 15°   | 2394.3 | 2397.1 | 2389.4 | 2370.7 | 2334.9 | 2292.5 | 2222.0 | 2152.6 | 2063.5 | 1973.2 | 1918.7 |
| 17.5° | 2459.8 | 2459.3 | 2452.7 | 2440.0 | 2420.2 | 2377.3 | 2301.3 | 2211.6 | 2107.5 | 1995.7 | 1935.2 |
| 20°   | 2502.2 | 2506.1 | 2500.6 | 2507.2 | 2494.5 | 2458.7 | 2383.3 | 2277.1 | 2157.0 | 2022.7 | 1953.9 |
| 22.5° | 2540.8 | 2541.3 | 2545.7 | 2552.9 | 2554.0 | 2538.0 | 2475.8 | 2355.2 | 2209.9 | 2054.1 | 1971.5 |
| 25°   | 2607.4 | 2604.1 | 2604.6 | 2604.6 | 2616.2 | 2616.8 | 2565.6 | 2450.5 | 2277.6 | 2095.4 | 2001.2 |
| 27.5° | 2730.7 | 2725.8 | 2701.0 | 2683.4 | 2683.4 | 2697.1 | 2665.8 | 2549.6 | 2352.5 | 2136.1 | 2029.3 |
| 30°   | 2926.2 | 2916.3 | 2866.2 | 2802.3 | 2779.7 | 2792.9 | 2769.3 | 2659.7 | 2431.2 | 2186.8 | 2057.9 |
| 32.5° | 3107.3 | 3105.6 | 3057.2 | 2977.4 | 2924.5 | 2906.9 | 2886.0 | 2779.7 | 2529.8 | 2239.6 | 2099.2 |
| 35°   | 3282.4 | 3279.6 | 3228.4 | 3184.4 | 3110.0 | 3045.1 | 3001.6 | 2878.3 | 2605.2 | 2289.7 | 2136.7 |
| 37.5° | 3532.3 | 3519.7 | 3459.6 | 3406.8 | 3296.7 | 3153.5 | 3105.6 | 2999.4 | 2716.4 | 2359.6 | 2200.5 |
| 40°   | 3791.6 | 3778.4 | 3676.6 | 3605.0 | 3488.3 | 3322.0 | 3233.4 | 3138.1 | 2825.4 | 2445.0 | 2273.8 |
| 42.5° | 4030.6 | 4012.9 | 3910.0 | 3775.1 | 3646.3 | 3500.4 | 3390.8 | 3268.6 | 2963.1 | 2531.4 | 2345.9 |
| 45°   | 4409.9 | 4274.5 | 4151.1 | 4046.0 | 3815.3 | 3674.4 | 3561.5 | 3438.2 | 3110.0 | 2631.1 | 2432.3 |
| 47.5° | 4343.3 | 4316.3 | 4310.2 | 4309.7 | 3984.3 | 3863.2 | 3743.7 | 3597.3 | 3258.7 | 2727.4 | 2514.9 |
| 50°   | 4522.8 | 4486.4 | 4555.2 | 4461.1 | 4146.2 | 4052.6 | 3928.2 | 3766.9 | 3408.4 | 2816.1 | 2595.8 |
| 52.5° | 4692.3 | 4697.8 | 4679.7 | 4509.5 | 4330.6 | 4227.7 | 4128.6 | 3943.6 | 3546.1 | 2905.2 | 2666.3 |
| 55°   | 4954.4 | 4901.0 | 4847.6 | 4684.1 | 4521.1 | 4407.1 | 4338.3 | 4106.0 | 3668.9 | 2980.1 | 2717.0 |
| 57°   | 5058.4 | 4986.9 | 4943.4 | 4779.9 | 4674.2 | 4580.6 | 4483.7 | 4235.4 | 3745.4 | 3012.0 | 2739.0 |
| 57.5° | 5055.1 | 4989.1 | 4962.1 | 4788.7 | 4699.5 | 4618.0 | 4507.3 | 4256.3 | 3753.6 | 3009.8 | 2734.6 |
| 60°   | 4848.7 | 4837.7 | 4937.9 | 4796.4 | 4795.3 | 4774.4 | 4648.3 | 4342.2 | 3772.9 | 2977.9 | 2687.2 |
| 62.5° | 4422.6 | 4470.5 | 4671.4 | 4729.2 | 4867.4 | 4912.5 | 4711.0 | 4313.0 | 3687.0 | 2856.8 | 2565.6 |
| 65°   | 3899.0 | 3989.3 | 4237.0 | 4510.1 | 4856.4 | 4994.6 | 4698.4 | 4158.8 | 3483.3 | 2637.7 | 2336.5 |
| 67.5° | 3300.5 | 3385.3 | 3673.3 | 4097.2 | 4669.2 | 4866.8 | 4534.3 | 3868.7 | 3151.3 | 2339.3 | 2042.5 |
| 70°   | 2662.5 | 2726.9 | 2965.8 | 3464.0 | 4208.4 | 4493.0 | 4097.7 | 3431.6 | 2690.0 | 1976.5 | 1696.2 |
| 72.5° | 2027.7 | 2052.4 | 2276.5 | 2746.1 | 3462.9 | 3817.5 | 3409.0 | 2820.5 | 2224.2 | 1583.9 | 1364.3 |
| 75°   | 1471.1 | 1496.4 | 1686.3 | 1974.3 | 2518.8 | 2972.4 | 2656.4 | 2191.7 | 1693.5 | 1206.8 | 1046.6 |
| 77.5° | 1051.0 | 1078.5 | 1184.2 | 1351.0 | 1723.2 | 2110.3 | 1885.1 | 1600.4 | 1167.7 | 790.6  | 725.6  |
| 80°   | 746.5  | 757.6  | 868.2  | 932.6  | 1118.7 | 1359.3 | 1296.5 | 1104.4 | 747.6  | 528.5  | 485.6  |
| 82.5° | 514.8  | 523.6  | 616.6  | 649.6  | 722.9  | 860.5  | 860.5  | 752.6  | 474.0  | 344.6  | 329.2  |
| 85°   | 304.5  | 306.1  | 379.9  | 411.3  | 422.8  | 511.5  | 525.8  | 409.1  | 260.4  | 155.8  | 154.2  |
| 87.5° | 113.4  | 112.9  | 173.4  | 158.6  | 138.7  | 155.8  | 180.6  | 123.3  | 89.7   | 40.2   | 30.8   |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

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CATALOG NUMBER: USSL-70-740-U-T4W

**CANDELA DISTRIBUTION (continued):**

|       | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1875.2 | 1875.2 | 1875.2 | 1875.2 | 1875.2 | 1875.2 | 1875.2 | 1875.2 | 1875.2 | 1875.2 |
| 2.5°  | 1864.7 | 1852.0 | 1843.8 | 1830.0 | 1818.5 | 1804.7 | 1800.8 | 1788.7 | 1787.1 | 1783.8 |
| 5°    | 1855.9 | 1826.2 | 1797.5 | 1772.2 | 1754.0 | 1736.4 | 1727.1 | 1716.1 | 1709.5 | 1713.3 |
| 7.5°  | 1853.7 | 1808.6 | 1762.3 | 1728.7 | 1702.3 | 1675.9 | 1665.4 | 1659.9 | 1659.9 | 1665.4 |
| 10°   | 1857.5 | 1794.2 | 1736.4 | 1689.6 | 1656.6 | 1632.9 | 1621.9 | 1617.5 | 1624.1 | 1626.3 |
| 12.5° | 1864.7 | 1787.6 | 1717.2 | 1660.5 | 1624.7 | 1599.9 | 1597.7 | 1601.0 | 1609.8 | 1613.7 |
| 15°   | 1869.1 | 1775.0 | 1692.4 | 1627.4 | 1596.0 | 1582.8 | 1580.6 | 1592.7 | 1611.5 | 1617.5 |
| 17.5° | 1880.1 | 1760.7 | 1660.5 | 1598.8 | 1570.2 | 1568.5 | 1575.1 | 1587.8 | 1611.5 | 1615.9 |
| 20°   | 1879.6 | 1741.4 | 1629.1 | 1563.6 | 1549.8 | 1555.3 | 1568.0 | 1585.0 | 1609.3 | 1617.0 |
| 22.5° | 1889.5 | 1718.3 | 1594.9 | 1528.3 | 1522.3 | 1541.0 | 1559.7 | 1576.2 | 1605.4 | 1614.2 |
| 25°   | 1903.2 | 1699.0 | 1554.7 | 1490.3 | 1492.5 | 1516.8 | 1544.3 | 1565.2 | 1593.8 | 1601.5 |
| 27.5° | 1917.0 | 1680.8 | 1511.8 | 1443.5 | 1447.9 | 1482.6 | 1525.0 | 1548.1 | 1575.1 | 1588.9 |
| 30°   | 1934.1 | 1660.5 | 1466.7 | 1391.8 | 1397.8 | 1439.7 | 1487.6 | 1519.0 | 1549.2 | 1561.9 |
| 32.5° | 1953.3 | 1643.4 | 1421.0 | 1336.7 | 1338.4 | 1391.8 | 1455.1 | 1490.3 | 1514.6 | 1529.4 |
| 35°   | 1978.1 | 1629.6 | 1376.4 | 1276.2 | 1276.7 | 1336.2 | 1413.3 | 1455.1 | 1476.6 | 1493.1 |
| 37.5° | 2028.2 | 1626.3 | 1335.1 | 1218.9 | 1217.3 | 1288.3 | 1367.6 | 1415.5 | 1433.6 | 1447.4 |
| 40°   | 2084.4 | 1624.1 | 1291.6 | 1161.7 | 1162.2 | 1236.5 | 1320.2 | 1370.3 | 1383.5 | 1396.7 |
| 42.5° | 2146.0 | 1618.6 | 1245.3 | 1108.3 | 1111.6 | 1188.1 | 1274.5 | 1323.0 | 1333.4 | 1344.4 |
| 45°   | 2208.2 | 1607.1 | 1191.4 | 1058.7 | 1061.5 | 1140.7 | 1223.3 | 1270.7 | 1278.9 | 1290.5 |
| 47.5° | 2267.7 | 1583.4 | 1140.7 | 1011.4 | 1023.5 | 1091.2 | 1165.5 | 1204.6 | 1209.6 | 1222.8 |
| 50°   | 2322.8 | 1549.8 | 1088.4 | 973.4  | 980.0  | 1037.2 | 1102.2 | 1131.9 | 1135.2 | 1141.3 |
| 52.5° | 2367.9 | 1500.8 | 1029.0 | 932.6  | 937.6  | 981.6  | 1038.9 | 1064.2 | 1061.5 | 1064.8 |
| 55°   | 2383.9 | 1432.0 | 973.4  | 891.3  | 890.8  | 922.7  | 975.6  | 1004.2 | 1000.3 | 999.2  |
| 57°   | 2371.8 | 1363.2 | 930.4  | 859.4  | 857.2  | 879.2  | 923.8  | 948.6  | 952.4  | 955.8  |
| 57.5° | 2360.2 | 1346.1 | 917.2  | 851.1  | 848.4  | 868.8  | 911.7  | 935.4  | 941.4  | 940.9  |
| 60°   | 2271.0 | 1237.6 | 860.5  | 814.8  | 803.2  | 817.0  | 852.8  | 871.5  | 871.5  | 875.9  |
| 62.5° | 2109.2 | 1116.5 | 811.5  | 772.4  | 750.9  | 766.9  | 796.1  | 810.4  | 800.5  | 803.2  |
| 65°   | 1879.6 | 993.2  | 762.5  | 726.2  | 698.6  | 718.5  | 747.1  | 765.3  | 756.5  | 754.8  |
| 67.5° | 1615.9 | 879.2  | 710.2  | 672.8  | 653.0  | 672.8  | 709.1  | 746.0  | 746.5  | 746.0  |
| 70°   | 1338.9 | 779.6  | 654.1  | 617.7  | 600.6  | 625.4  | 676.6  | 731.7  | 735.0  | 732.2  |
| 72.5° | 1081.8 | 693.1  | 594.6  | 561.6  | 547.8  | 580.3  | 640.8  | 704.7  | 709.1  | 710.8  |
| 75°   | 854.5  | 614.4  | 527.4  | 503.2  | 496.0  | 529.6  | 597.3  | 664.5  | 655.7  | 661.2  |
| 77.5° | 610.6  | 520.8  | 456.4  | 439.9  | 436.6  | 461.9  | 528.0  | 573.1  | 560.5  | 559.9  |
| 80°   | 436.0  | 428.3  | 383.2  | 373.8  | 367.8  | 385.9  | 434.4  | 475.7  | 463.0  | 453.1  |
| 82.5° | 336.9  | 335.8  | 313.8  | 284.6  | 278.6  | 312.2  | 353.5  | 370.5  | 269.2  | 272.0  |
| 85°   | 203.2  | 212.0  | 187.2  | 188.8  | 203.2  | 223.5  | 246.1  | 257.1  | 128.8  | 101.9  |
| 87.5° | 47.3   | 49.0   | 58.4   | 71.0   | 73.8   | 86.4   | 118.4  | 142.0  | 57.3   | 46.8   |
| 90°   | 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

McGraw-Edison

Report Number: SP2-2501-321-1

Test Date: 04/09/2025

Luminaire Tested: GKO-PB1E-740-U-T4W

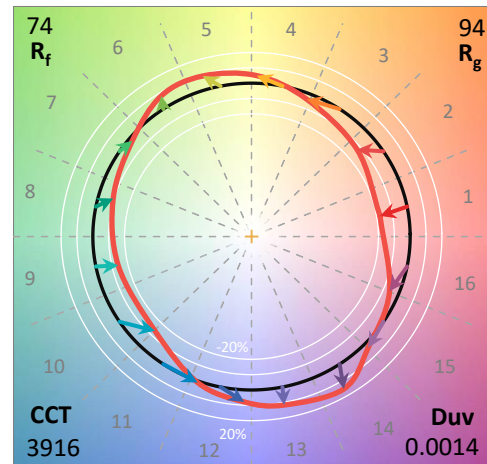
Data in this report applies to families of products including GKO-PB1E-740-U-T4W

### Test Information

Test Method: LM-79-2019  
 Report Number: SP2-2501-321-1  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP2 - 165CM SPHERE  
 Measurement Geometry:  $4\pi$   
 Issue Date: 04/10/2025  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: McGraw-Edison  
 Catalog Number: **GKO-PB1E-740-U-T4W**  
 Description: Gekko Wedge Wall Pack Fixture 1 SQ w/ T4W distribution

### Spectral Parameters

|                           |          |           |      |      |       |
|---------------------------|----------|-----------|------|------|-------|
| CCT (K):                  | 3916     | CRI (Ra): | 71.0 |      |       |
| CIE u':                   | 0.2259   | R1:       | 67.4 | R9:  | -37.9 |
| CIE v':                   | 0.5049   | R2:       | 78.3 | R10: | 48.9  |
| Duv:                      | 0.0014   | R3:       | 87.2 | R11: | 64.6  |
| CIE x:                    | 0.3853   | R4:       | 69.5 | R12: | 40.9  |
| CIE y:                    | 0.3827   | R5:       | 67.2 | R13: | 69.2  |
| CIE z:                    | 0.2321   | R6:       | 69.3 | R14: | 92.7  |
| Peak Wavelength (nm):     | 449      | R7:       | 79.9 | R15: | 59.8  |
| Dominant Wavelength (nm): | 578      | R8:       | 48.9 |      |       |
| Purity:                   | 30.46652 |           |      |      |       |
| Rf:                       | 73.5     |           |      |      |       |
| Rg:                       | 93.5     |           |      |      |       |



### Test Conditions

Stabilization Time: 33M  
 Operation Time: 1H 33M  
 Sphere Temperature (°C): 25.0

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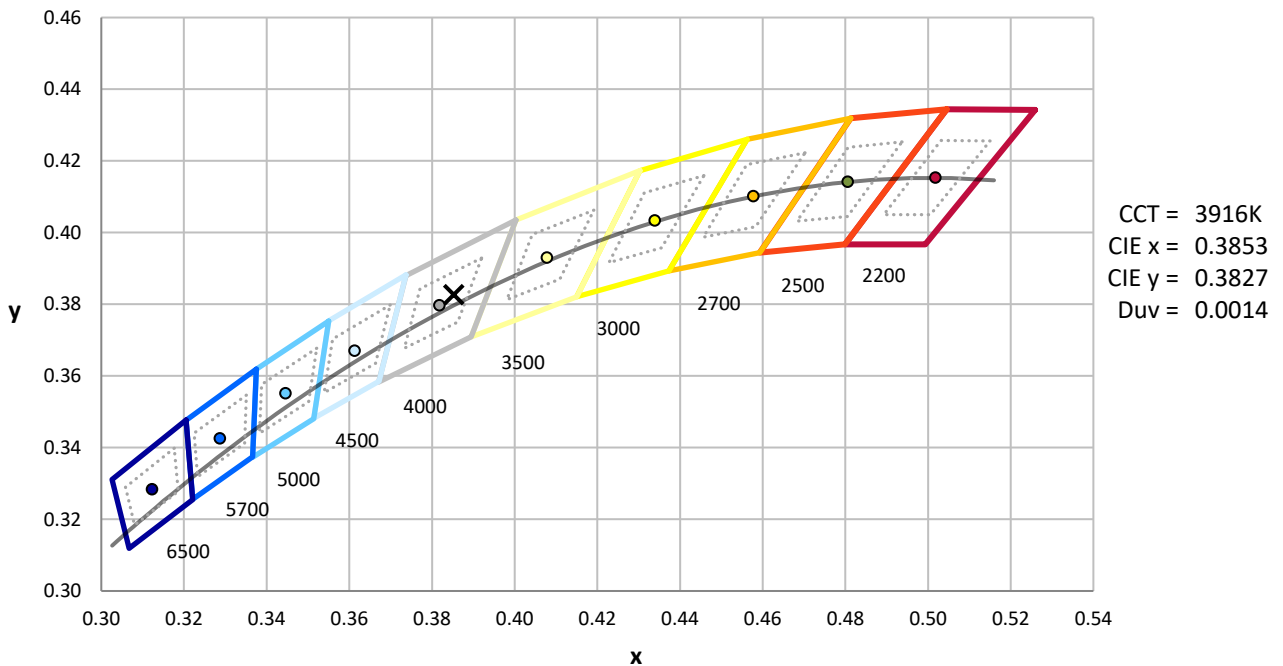
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | IN2187                | 1/6/2025         | 7/6/2025             |
| Power Meter                    | INXT2011002           | 1/21/2025        | 1/21/2026            |
| AC Power Source                | IN0458                | 10/22/2024       | 10/22/2025           |
| DC Power Source                | IN0212                | 10/22/2024       | 10/22/2025           |
| Sphere Thermometer             | IN4036B               | 10/22/2024       | 10/22/2025           |
| Room Thermometer               | IN0046                | 10/22/2024       | 10/22/2025           |

REPORT NUMBER: SP2-2501-321-1

**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

REPORT NUMBER: SP2-2501-321-1

### Photopic Flux vs. Wavelength



### Photopic Lumens: NR

| λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) |
|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|
| 360       | 0                           | NR               | 490       | 132                         | NR               | 620       | 668                         | NR               | 750       | 17                          | NR               | 880       | 1                           | NR               |
| 365       | 0                           | NR               | 495       | 174                         | NR               | 625       | 611                         | NR               | 755       | 15                          | NR               | 885       | 0                           | NR               |
| 370       | 0                           | NR               | 500       | 238                         | NR               | 630       | 554                         | NR               | 760       | 13                          | NR               | 890       | 0                           | NR               |
| 375       | 0                           | NR               | 505       | 314                         | NR               | 635       | 498                         | NR               | 765       | 11                          | NR               | 895       | 0                           | NR               |
| 380       | 0                           | NR               | 510       | 392                         | NR               | 640       | 445                         | NR               | 770       | 10                          | NR               | 900       | 0                           | NR               |
| 385       | 1                           | NR               | 515       | 467                         | NR               | 645       | 394                         | NR               | 775       | 8                           | NR               | 905       | 0                           | NR               |
| 390       | 2                           | NR               | 520       | 526                         | NR               | 650       | 347                         | NR               | 780       | 7                           | NR               | 910       | 0                           | NR               |
| 395       | 4                           | NR               | 525       | 575                         | NR               | 655       | 305                         | NR               | 785       | 6                           | NR               | 915       | 0                           | NR               |
| 400       | 6                           | NR               | 530       | 613                         | NR               | 660       | 266                         | NR               | 790       | 5                           | NR               | 920       | 0                           | NR               |
| 405       | 10                          | NR               | 535       | 644                         | NR               | 665       | 231                         | NR               | 795       | 5                           | NR               | 925       | 0                           | NR               |
| 410       | 18                          | NR               | 540       | 673                         | NR               | 670       | 200                         | NR               | 800       | 4                           | NR               | 930       | 0                           | NR               |
| 415       | 34                          | NR               | 545       | 703                         | NR               | 675       | 174                         | NR               | 805       | 4                           | NR               | 935       | 0                           | NR               |
| 420       | 66                          | NR               | 550       | 734                         | NR               | 680       | 150                         | NR               | 810       | 3                           | NR               | 940       | 0                           | NR               |
| 425       | 124                         | NR               | 555       | 768                         | NR               | 685       | 129                         | NR               | 815       | 3                           | NR               | 945       | 0                           | NR               |
| 430       | 216                         | NR               | 560       | 804                         | NR               | 690       | 111                         | NR               | 820       | 2                           | NR               | 950       | 0                           | NR               |
| 435       | 352                         | NR               | 565       | 838                         | NR               | 695       | 95                          | NR               | 825       | 2                           | NR               | 955       | 0                           | NR               |
| 440       | 548                         | NR               | 570       | 872                         | NR               | 700       | 81                          | NR               | 830       | 2                           | NR               | 960       | 0                           | NR               |
| 445       | 836                         | NR               | 575       | 896                         | NR               | 705       | 69                          | NR               | 835       | 2                           | NR               | 965       | 0                           | NR               |
| 450       | 997                         | NR               | 580       | 913                         | NR               | 710       | 60                          | NR               | 840       | 1                           | NR               | 970       | 0                           | NR               |
| 455       | 705                         | NR               | 585       | 917                         | NR               | 715       | 51                          | NR               | 845       | 1                           | NR               | 975       | 0                           | NR               |
| 460       | 429                         | NR               | 590       | 911                         | NR               | 720       | 44                          | NR               | 850       | 1                           | NR               | 980       | 0                           | NR               |
| 465       | 316                         | NR               | 595       | 891                         | NR               | 725       | 38                          | NR               | 855       | 1                           | NR               | 985       | 0                           | NR               |
| 470       | 213                         | NR               | 600       | 862                         | NR               | 730       | 32                          | NR               | 860       | 1                           | NR               | 990       | 0                           | NR               |
| 475       | 143                         | NR               | 605       | 822                         | NR               | 735       | 28                          | NR               | 865       | 1                           | NR               | 995       | 0                           | NR               |
| 480       | 121                         | NR               | 610       | 776                         | NR               | 740       | 24                          | NR               | 870       | 1                           | NR               | 1000      | 0                           | NR               |
| 485       | 118                         | NR               | 615       | 725                         | NR               | 745       | 20                          | NR               | 875       | 1                           | NR               |           |                             |                  |

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### Scotopic Flux vs. Wavelength



Scotopic Lumens: NR

S/P: 1.49

| 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    | 132                      | NR            | 620    | 668                      | NR            | 750    | 17                       | NR            | 880    | 1                        | NR            |
| 365    | 0                        | NR            | 495    | 174                      | NR            | 625    | 611                      | NR            | 755    | 15                       | NR            | 885    | 0                        | NR            |
| 370    | 0                        | NR            | 500    | 238                      | NR            | 630    | 554                      | NR            | 760    | 13                       | NR            | 890    | 0                        | NR            |
| 375    | 0                        | NR            | 505    | 314                      | NR            | 635    | 498                      | NR            | 765    | 11                       | NR            | 895    | 0                        | NR            |
| 380    | 0                        | NR            | 510    | 392                      | NR            | 640    | 445                      | NR            | 770    | 10                       | NR            | 900    | 0                        | NR            |
| 385    | 1                        | NR            | 515    | 467                      | NR            | 645    | 394                      | NR            | 775    | 8                        | NR            | 905    | 0                        | NR            |
| 390    | 2                        | NR            | 520    | 526                      | NR            | 650    | 347                      | NR            | 780    | 7                        | NR            | 910    | 0                        | NR            |
| 395    | 4                        | NR            | 525    | 575                      | NR            | 655    | 305                      | NR            | 785    | 6                        | NR            | 915    | 0                        | NR            |
| 400    | 6                        | NR            | 530    | 613                      | NR            | 660    | 266                      | NR            | 790    | 5                        | NR            | 920    | 0                        | NR            |
| 405    | 10                       | NR            | 535    | 644                      | NR            | 665    | 231                      | NR            | 795    | 5                        | NR            | 925    | 0                        | NR            |
| 410    | 18                       | NR            | 540    | 673                      | NR            | 670    | 200                      | NR            | 800    | 4                        | NR            | 930    | 0                        | NR            |
| 415    | 34                       | NR            | 545    | 703                      | NR            | 675    | 174                      | NR            | 805    | 4                        | NR            | 935    | 0                        | NR            |
| 420    | 66                       | NR            | 550    | 734                      | NR            | 680    | 150                      | NR            | 810    | 3                        | NR            | 940    | 0                        | NR            |
| 425    | 124                      | NR            | 555    | 768                      | NR            | 685    | 129                      | NR            | 815    | 3                        | NR            | 945    | 0                        | NR            |
| 430    | 216                      | NR            | 560    | 804                      | NR            | 690    | 111                      | NR            | 820    | 2                        | NR            | 950    | 0                        | NR            |
| 435    | 352                      | NR            | 565    | 838                      | NR            | 695    | 95                       | NR            | 825    | 2                        | NR            | 955    | 0                        | NR            |
| 440    | 548                      | NR            | 570    | 872                      | NR            | 700    | 81                       | NR            | 830    | 2                        | NR            | 960    | 0                        | NR            |
| 445    | 836                      | NR            | 575    | 896                      | NR            | 705    | 69                       | NR            | 835    | 2                        | NR            | 965    | 0                        | NR            |
| 450    | 997                      | NR            | 580    | 913                      | NR            | 710    | 60                       | NR            | 840    | 1                        | NR            | 970    | 0                        | NR            |
| 455    | 705                      | NR            | 585    | 917                      | NR            | 715    | 51                       | NR            | 845    | 1                        | NR            | 975    | 0                        | NR            |
| 460    | 429                      | NR            | 590    | 911                      | NR            | 720    | 44                       | NR            | 850    | 1                        | NR            | 980    | 0                        | NR            |
| 465    | 316                      | NR            | 595    | 891                      | NR            | 725    | 38                       | NR            | 855    | 1                        | NR            | 985    | 0                        | NR            |
| 470    | 213                      | NR            | 600    | 862                      | NR            | 730    | 32                       | NR            | 860    | 1                        | NR            | 990    | 0                        | NR            |
| 475    | 143                      | NR            | 605    | 822                      | NR            | 735    | 28                       | NR            | 865    | 1                        | NR            | 995    | 0                        | NR            |
| 480    | 121                      | NR            | 610    | 776                      | NR            | 740    | 24                       | NR            | 870    | 1                        | NR            | 1000   | 0                        | NR            |
| 485    | 118                      | NR            | 615    | 725                      | NR            | 745    | 20                       | NR            | 875    | 1                        | NR            |        |                          |               |

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### Melanopic Flux vs. Wavelength



Melanopic Lumens: NR

M/P: 2.88

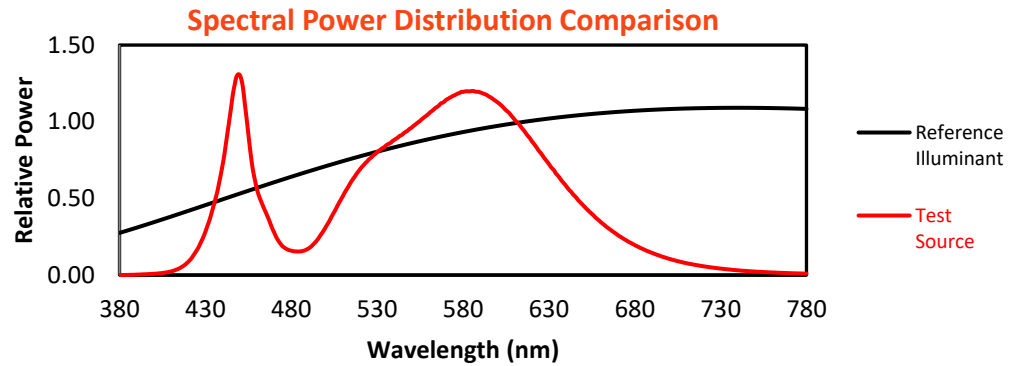
| $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | 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               | 132                                    | NR                             | 620               | 668                                    | NR                             | 750               | 17                                     | NR                             | 880               | 1                                      | NR                             |
| 365               | 0                                      | NR                             | 495               | 174                                    | NR                             | 625               | 611                                    | NR                             | 755               | 15                                     | NR                             | 885               | 0                                      | NR                             |
| 370               | 0                                      | NR                             | 500               | 238                                    | NR                             | 630               | 554                                    | NR                             | 760               | 13                                     | NR                             | 890               | 0                                      | NR                             |
| 375               | 0                                      | NR                             | 505               | 314                                    | NR                             | 635               | 498                                    | NR                             | 765               | 11                                     | NR                             | 895               | 0                                      | NR                             |
| 380               | 0                                      | NR                             | 510               | 392                                    | NR                             | 640               | 445                                    | NR                             | 770               | 10                                     | NR                             | 900               | 0                                      | NR                             |
| 385               | 1                                      | NR                             | 515               | 467                                    | NR                             | 645               | 394                                    | NR                             | 775               | 8                                      | NR                             | 905               | 0                                      | NR                             |
| 390               | 2                                      | NR                             | 520               | 526                                    | NR                             | 650               | 347                                    | NR                             | 780               | 7                                      | NR                             | 910               | 0                                      | NR                             |
| 395               | 4                                      | NR                             | 525               | 575                                    | NR                             | 655               | 305                                    | NR                             | 785               | 6                                      | NR                             | 915               | 0                                      | NR                             |
| 400               | 6                                      | NR                             | 530               | 613                                    | NR                             | 660               | 266                                    | NR                             | 790               | 5                                      | NR                             | 920               | 0                                      | NR                             |
| 405               | 10                                     | NR                             | 535               | 644                                    | NR                             | 665               | 231                                    | NR                             | 795               | 5                                      | NR                             | 925               | 0                                      | NR                             |
| 410               | 18                                     | NR                             | 540               | 673                                    | NR                             | 670               | 200                                    | NR                             | 800               | 4                                      | NR                             | 930               | 0                                      | NR                             |
| 415               | 34                                     | NR                             | 545               | 703                                    | NR                             | 675               | 174                                    | NR                             | 805               | 4                                      | NR                             | 935               | 0                                      | NR                             |
| 420               | 66                                     | NR                             | 550               | 734                                    | NR                             | 680               | 150                                    | NR                             | 810               | 3                                      | NR                             | 940               | 0                                      | NR                             |
| 425               | 124                                    | NR                             | 555               | 768                                    | NR                             | 685               | 129                                    | NR                             | 815               | 3                                      | NR                             | 945               | 0                                      | NR                             |
| 430               | 216                                    | NR                             | 560               | 804                                    | NR                             | 690               | 111                                    | NR                             | 820               | 2                                      | NR                             | 950               | 0                                      | NR                             |
| 435               | 352                                    | NR                             | 565               | 838                                    | NR                             | 695               | 95                                     | NR                             | 825               | 2                                      | NR                             | 955               | 0                                      | NR                             |
| 440               | 548                                    | NR                             | 570               | 872                                    | NR                             | 700               | 81                                     | NR                             | 830               | 2                                      | NR                             | 960               | 0                                      | NR                             |
| 445               | 836                                    | NR                             | 575               | 896                                    | NR                             | 705               | 69                                     | NR                             | 835               | 2                                      | NR                             | 965               | 0                                      | NR                             |
| 450               | 997                                    | NR                             | 580               | 913                                    | NR                             | 710               | 60                                     | NR                             | 840               | 1                                      | NR                             | 970               | 0                                      | NR                             |
| 455               | 705                                    | NR                             | 585               | 917                                    | NR                             | 715               | 51                                     | NR                             | 845               | 1                                      | NR                             | 975               | 0                                      | NR                             |
| 460               | 429                                    | NR                             | 590               | 911                                    | NR                             | 720               | 44                                     | NR                             | 850               | 1                                      | NR                             | 980               | 0                                      | NR                             |
| 465               | 316                                    | NR                             | 595               | 891                                    | NR                             | 725               | 38                                     | NR                             | 855               | 1                                      | NR                             | 985               | 0                                      | NR                             |
| 470               | 213                                    | NR                             | 600               | 862                                    | NR                             | 730               | 32                                     | NR                             | 860               | 1                                      | NR                             | 990               | 0                                      | NR                             |
| 475               | 143                                    | NR                             | 605               | 822                                    | NR                             | 735               | 28                                     | NR                             | 865               | 1                                      | NR                             | 995               | 0                                      | NR                             |
| 480               | 121                                    | NR                             | 610               | 776                                    | NR                             | 740               | 24                                     | NR                             | 870               | 1                                      | NR                             | 1000              | 0                                      | NR                             |
| 485               | 118                                    | NR                             | 615               | 725                                    | NR                             | 745               | 20                                     | NR                             | 875               | 1                                      | NR                             |                   |                                        |                                |

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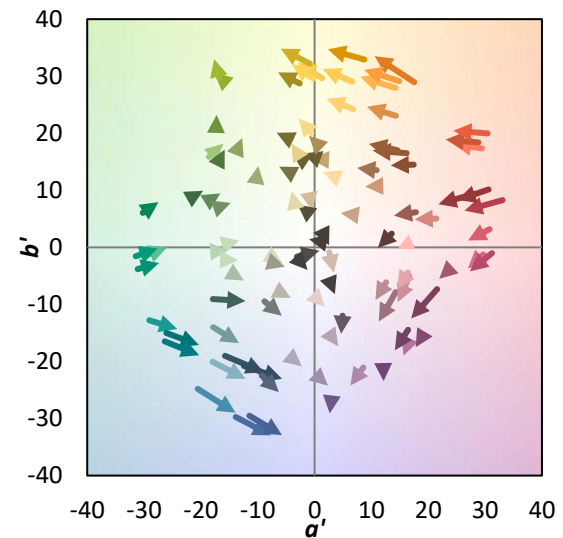
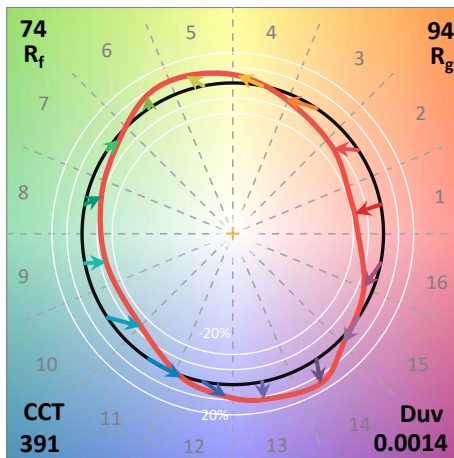
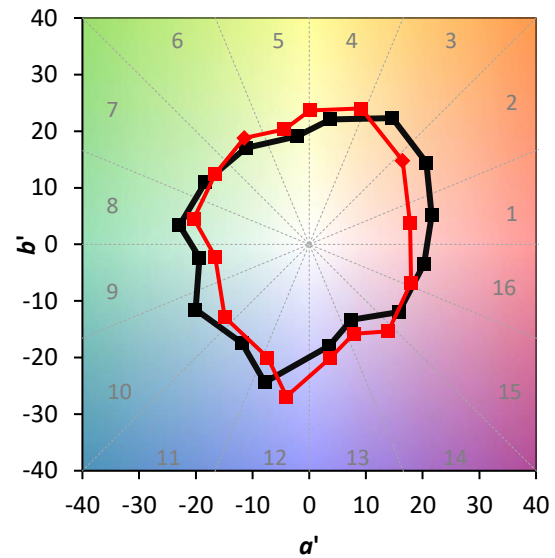
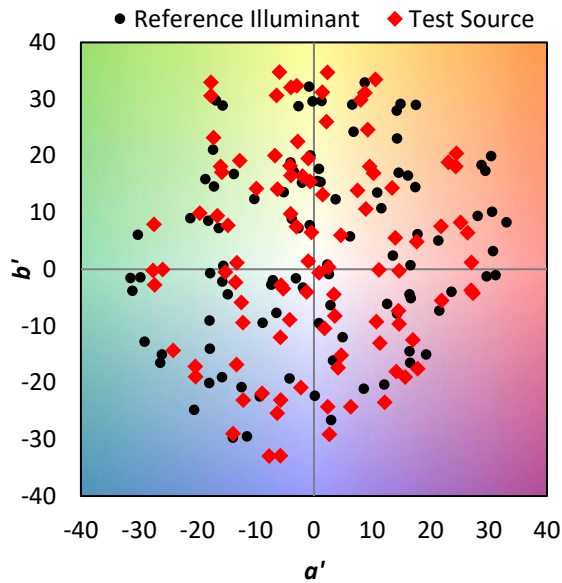
TM-30-18

### Summary

$R_f = 73.5$   
 $R_g = 93.5$   
 $CIE R_a = 71.0$   
 $R_g = -37.9$



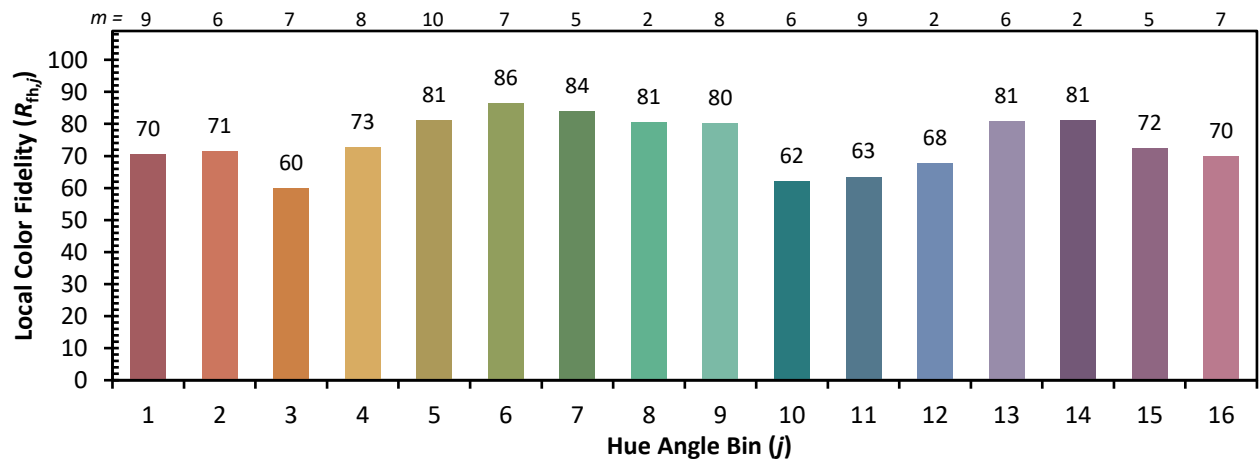
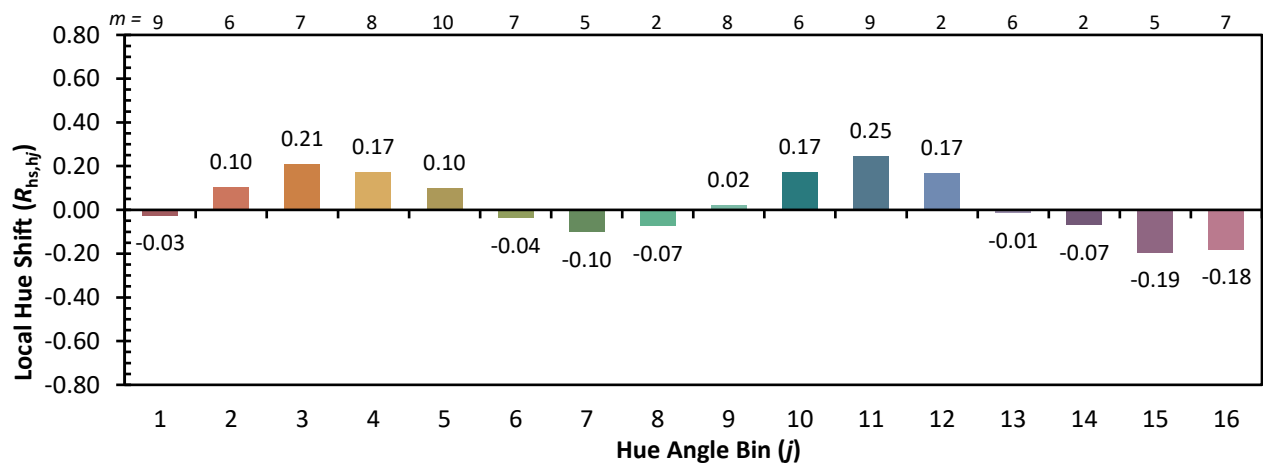
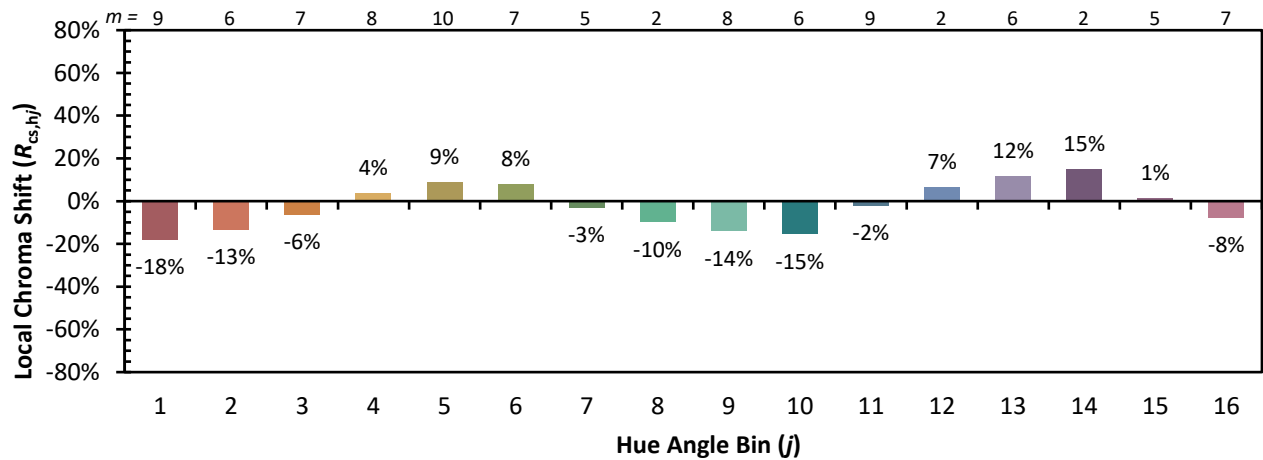
### Color Vector Graphics



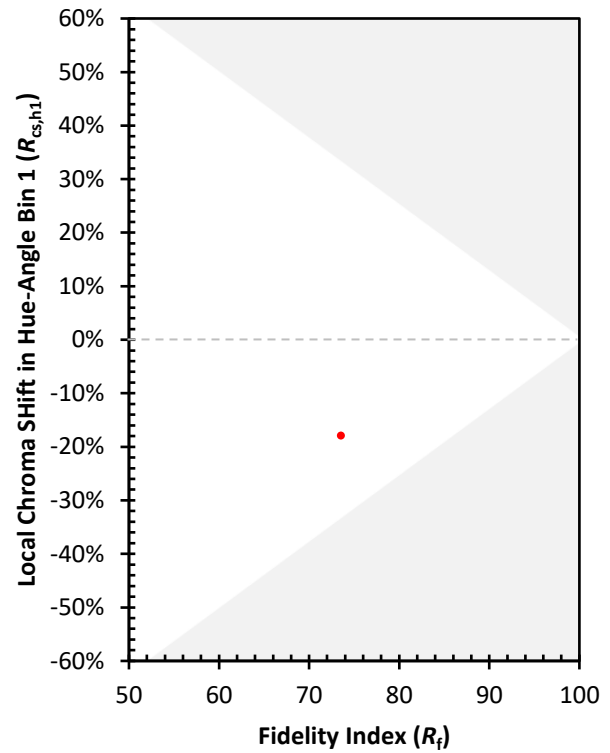
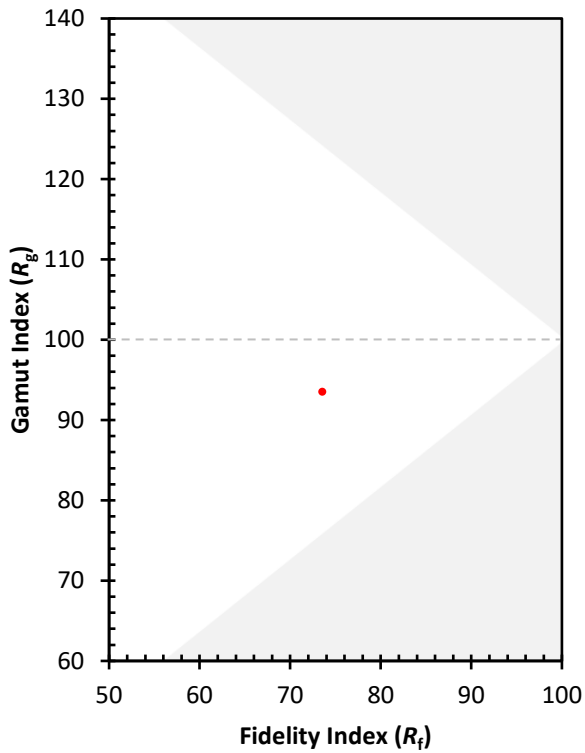
**Individual Sample Fidelity Index ( $R_{f,i}$ )**

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 62 | CES51 = 88 | CES76 = 51 |
| CES02 = 61 | CES27 = 88 | CES52 = 87 | CES77 = 70 |
| CES03 = 30 | CES28 = 81 | CES53 = 77 | CES78 = 54 |
| CES04 = 70 | CES29 = 66 | CES54 = 84 | CES79 = 81 |
| CES05 = 47 | CES30 = 82 | CES55 = 83 | CES80 = 79 |
| CES06 = 50 | CES31 = 69 | CES56 = 73 | CES81 = 77 |
| CES07 = 40 | CES32 = 61 | CES57 = 72 | CES82 = 91 |
| CES08 = 39 | CES33 = 77 | CES58 = 73 | CES83 = 90 |
| CES09 = 29 | CES34 = 70 | CES59 = 85 | CES84 = 86 |
| CES10 = 74 | CES35 = 84 | 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 = 75 |
| CES17 = 49 | CES42 = 81 | CES67 = 54 | CES92 = 58 |
| CES18 = 56 | CES43 = 77 | CES68 = 63 | CES93 = 75 |
| CES19 = 72 | CES44 = 99 | CES69 = 73 | CES94 = 52 |
| CES20 = 65 | CES45 = 85 | CES70 = 56 | CES95 = 65 |
| CES21 = 86 | CES46 = 83 | CES71 = 49 | CES96 = 76 |
| CES22 = 78 | CES47 = 86 | CES72 = 83 | CES97 = 84 |
| CES23 = 92 | CES48 = 77 | CES73 = 46 | CES98 = 75 |
| CES24 = 91 | CES49 = 81 | CES74 = 93 | CES99 = 62 |
| CES25 = 72 | CES50 = 87 | CES75 = 52 |            |



**Color Rendition by Hue-Angle Bin**


**Measure Comparisons**



(END OF REPORT)