

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: McGRAW-EDISON

Report Number: P385855

Luminaire Tested: **GWC-SA1C-722-U-SL3**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P385855  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-22)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: MCGRAW-EDISON  
Catalog Number: GWC-SA1C-722-U-SL3  
Description: GALLEON WALL LUMINAIRE  
(1) 70 CRI, 2200K, 1050mA LIGHTSQUARE WITH 16 LEDS AND TYPE III SPILL  
LIGHT ELIMINATOR OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 5554 lumens  
Efficiency: N/A  
Efficacy: 95.8 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 0.5' x H: 0')  
IES Classification: Type III - Medium  
BUG Rating: B1 - U0 - G2

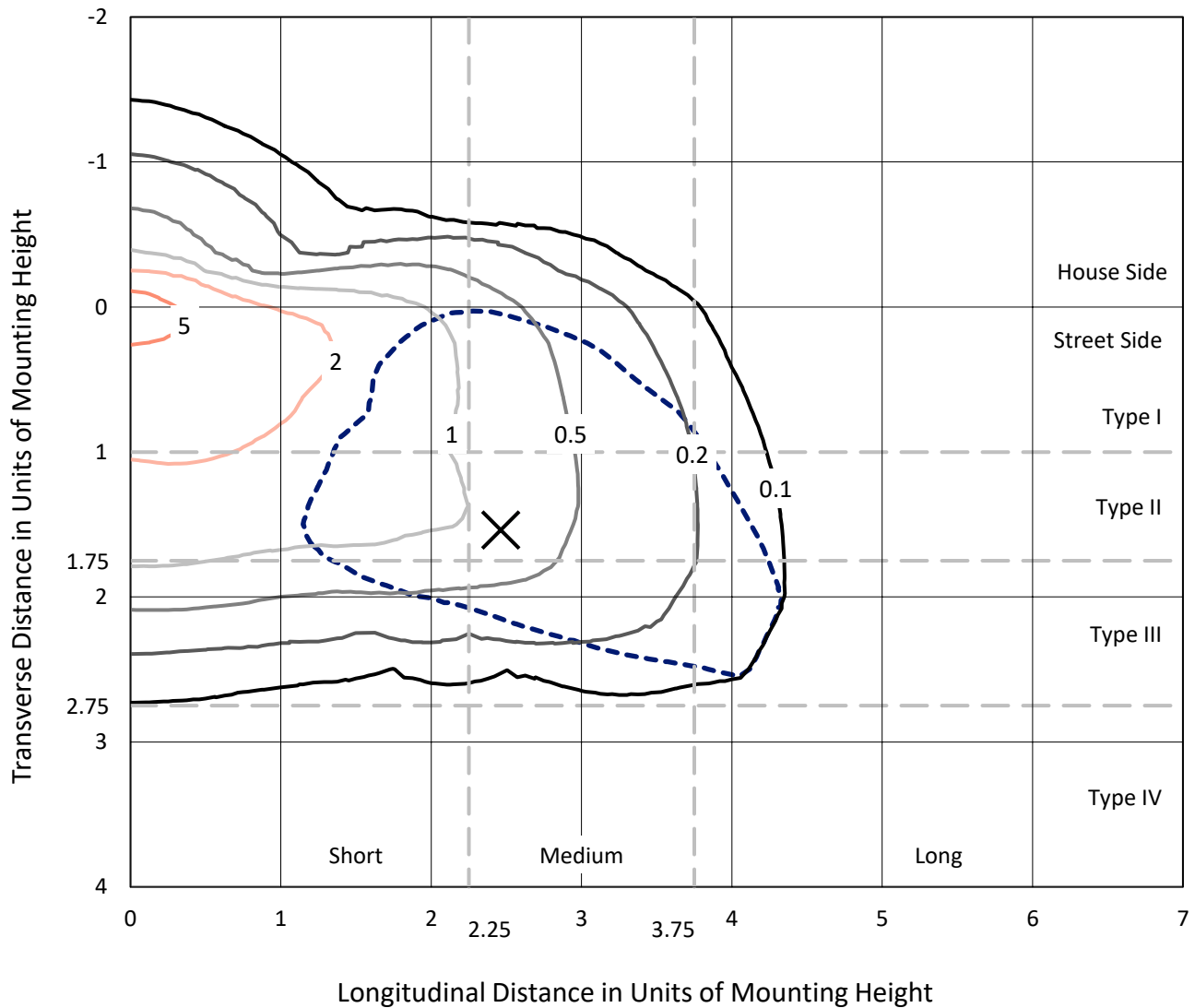
Input Watts (W): 58  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 28.75 FT



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## Iso-Footcandle Lines of Horizontal Illumination

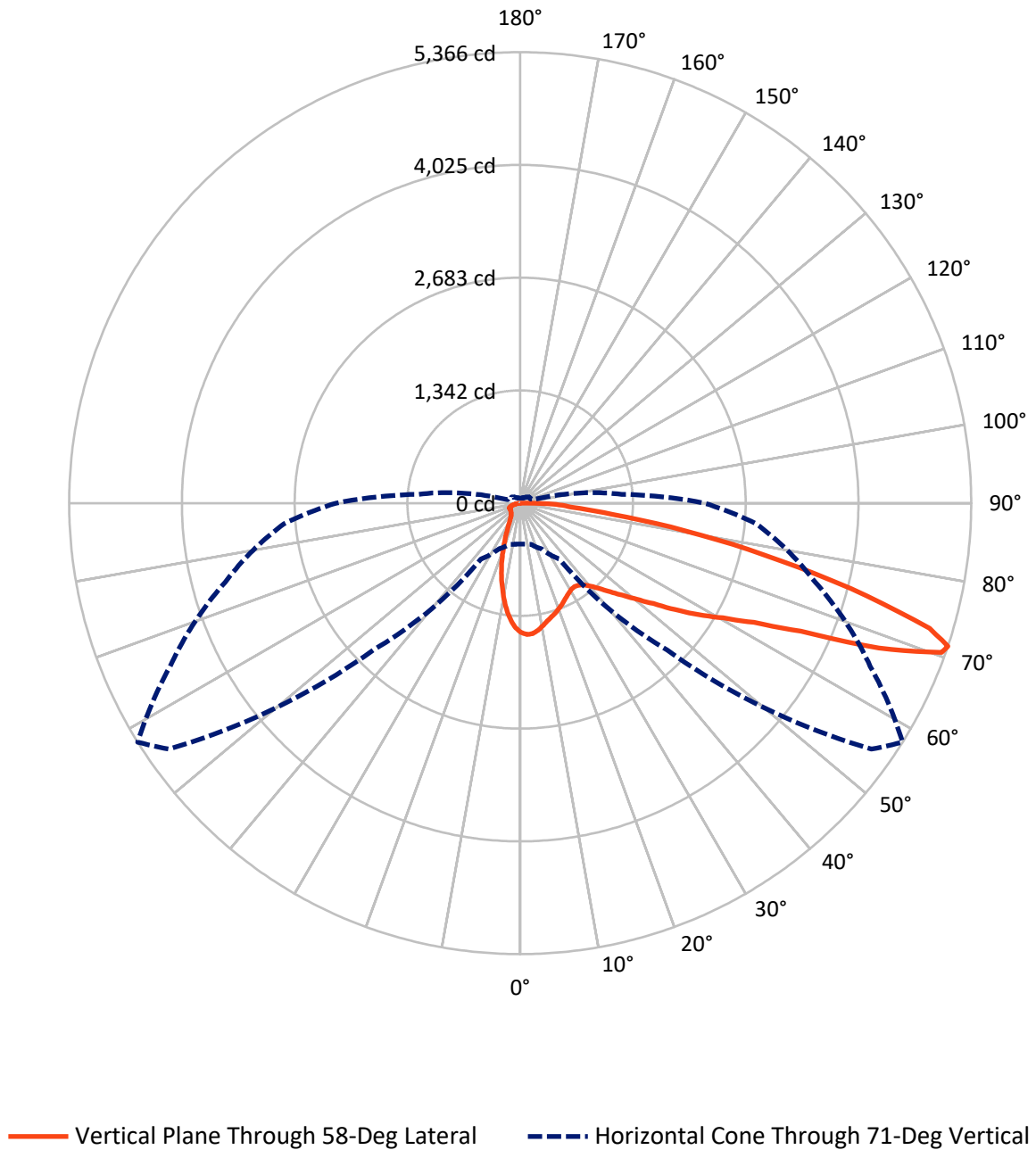
✕ Max cd  
 - - - 1/2 Max cd



Based on 15 foot mounting height. Maximum calculated value = 6.8 fc  
 Type III - Medium - N/A

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## Luminous Intensity Polar Plot



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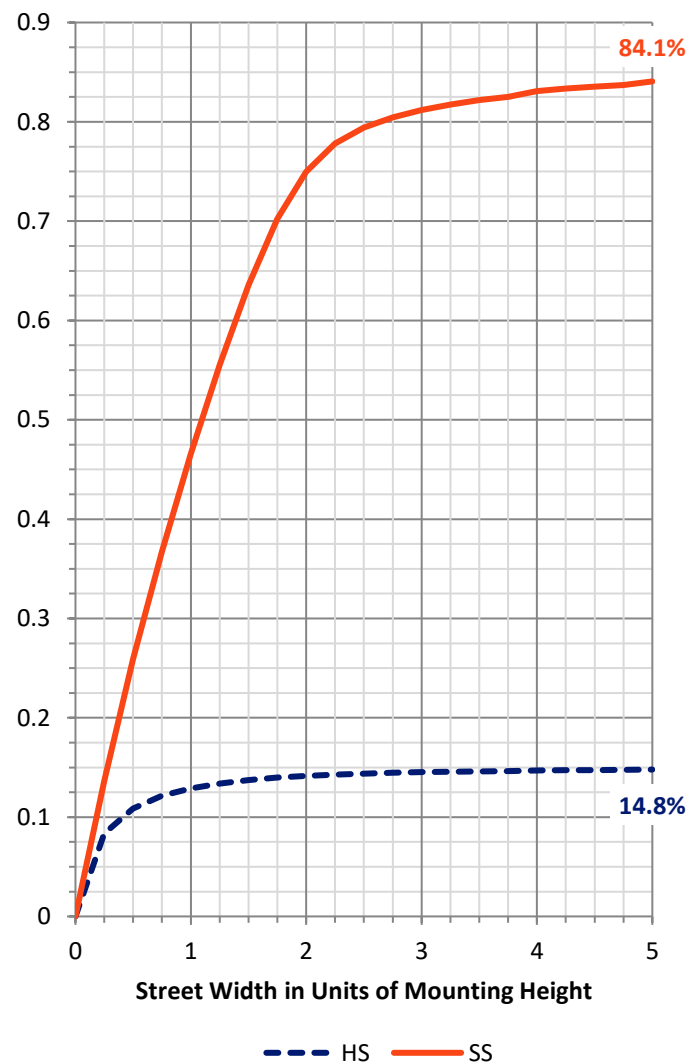
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 830.4    | 0.0    | 830.4  |
|                    | % Fixture | 15.0     | 0.0    | 15.0   |
| <b>Street Side</b> | Lumens    | 4723.6   | 0.0    | 4723.6 |
|                    | % Fixture | 85.0     | 0.0    | 85.0   |
| <b>Total</b>       | Lumens    | 5554.0   | 0.0    | 5554.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 132.8  | 2.4       |
| 10°-20°   | 295.2  | 5.3       |
| 20°-30°   | 375.2  | 6.8       |
| 30°-40°   | 477.9  | 8.6       |
| 40°-50°   | 677.7  | 12.2      |
| 50°-60°   | 1048.7 | 18.9      |
| 60°-70°   | 1427.7 | 25.7      |
| 70°-80°   | 952.4  | 17.1      |
| 80°-90°   | 166.5  | 3.0       |
| 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°    | 5554.0 | 100.0     |
| 0°-180°   | 5554.0 | 100.0     |

**Coefficient of Utilization**



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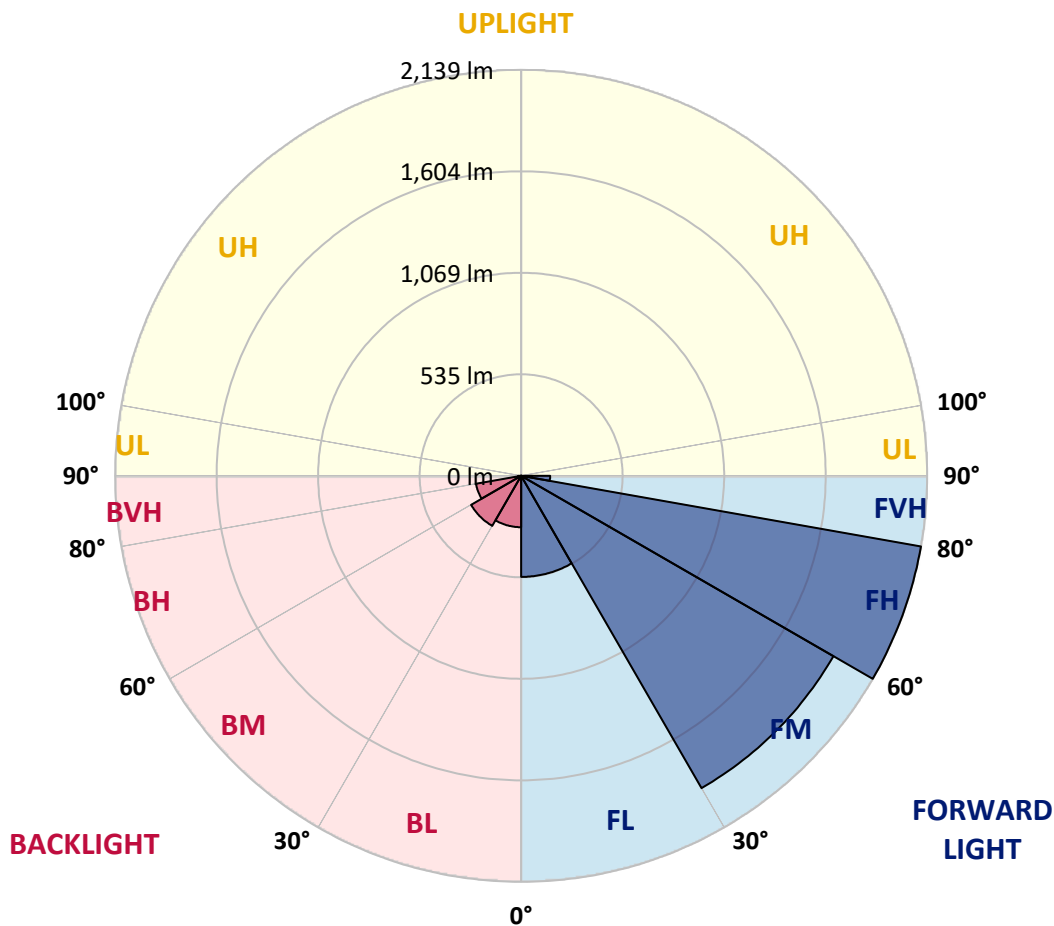
CATALOG NUMBER: GWC-SA1C-722-U-SL3

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 532.4  | 9.6       |                         |      |         |
| FM   | (30°-60°)   | 1899.7 | 34.2      |                         |      |         |
| FH   | (60°-80°)   | 2138.8 | 38.5      |                         |      | G2/5000 |
| FVH  | (80°-90°)   | 152.7  | 2.7       |                         |      | G2/225  |
| BL   | (0°-30°)    | 270.7  | 4.9       | B1/500                  |      |         |
| BM   | (30°-60°)   | 304.5  | 5.5       | B1/1000                 |      |         |
| BH   | (60°-80°)   | 241.3  | 4.3       | B1/500                  |      | G1/500  |
| BVH  | (80°-90°)   | 13.8   | 0.2       |                         |      | G1/100  |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

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

Type III Medium



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 58°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1538.8 | 1538.8 | 1538.8 | 1538.8 | 1538.8 | 1538.8 | 1538.8 | 1538.8 | 1538.8 | 1538.8 | 1538.8 |
| 2.5°  | 1579.7 | 1577.5 | 1578.3 | 1576.7 | 1573.1 | 1569.4 | 1564.0 | 1564.9 | 1557.4 | 1546.2 | 1532.3 |
| 5°    | 1549.9 | 1549.1 | 1554.9 | 1558.2 | 1560.9 | 1558.8 | 1557.2 | 1559.1 | 1548.1 | 1532.6 | 1508.5 |
| 7.5°  | 1487.4 | 1478.9 | 1486.2 | 1497.2 | 1507.7 | 1515.6 | 1526.1 | 1527.4 | 1520.5 | 1504.2 | 1472.5 |
| 10°   | 1398.6 | 1390.4 | 1401.3 | 1418.5 | 1439.4 | 1458.3 | 1479.4 | 1483.3 | 1484.7 | 1470.0 | 1431.5 |
| 12.5° | 1306.5 | 1300.3 | 1311.1 | 1335.3 | 1369.9 | 1399.1 | 1432.8 | 1438.6 | 1450.6 | 1440.7 | 1393.5 |
| 15°   | 1224.1 | 1221.7 | 1234.9 | 1258.7 | 1298.5 | 1343.2 | 1391.8 | 1402.4 | 1422.7 | 1419.5 | 1363.9 |
| 17.5° | 1152.9 | 1152.3 | 1162.3 | 1187.3 | 1231.4 | 1287.9 | 1351.0 | 1369.0 | 1399.1 | 1403.0 | 1339.6 |
| 20°   | 1099.9 | 1098.7 | 1105.7 | 1124.0 | 1169.5 | 1233.5 | 1306.9 | 1331.6 | 1375.2 | 1388.7 | 1314.4 |
| 22.5° | 1071.4 | 1071.2 | 1071.4 | 1080.1 | 1117.3 | 1176.9 | 1263.9 | 1294.1 | 1351.7 | 1377.3 | 1286.5 |
| 25°   | 1066.6 | 1066.0 | 1061.7 | 1060.8 | 1081.9 | 1129.5 | 1221.4 | 1254.6 | 1329.5 | 1369.4 | 1260.0 |
| 27.5° | 1079.2 | 1079.9 | 1074.3 | 1065.2 | 1069.5 | 1098.3 | 1184.4 | 1220.0 | 1311.7 | 1367.8 | 1241.7 |
| 30°   | 1105.3 | 1104.9 | 1100.0 | 1090.6 | 1082.2 | 1086.7 | 1158.1 | 1193.7 | 1299.7 | 1374.6 | 1229.1 |
| 32.5° | 1134.1 | 1136.2 | 1135.3 | 1130.0 | 1117.7 | 1099.9 | 1150.2 | 1185.0 | 1296.2 | 1390.8 | 1223.7 |
| 35°   | 1168.7 | 1171.1 | 1178.0 | 1182.1 | 1167.6 | 1138.9 | 1167.2 | 1197.4 | 1306.3 | 1421.4 | 1232.4 |
| 37.5° | 1201.6 | 1207.6 | 1227.2 | 1244.4 | 1232.0 | 1200.1 | 1212.5 | 1233.9 | 1337.4 | 1469.6 | 1255.8 |
| 40°   | 1239.5 | 1244.8 | 1276.7 | 1313.2 | 1311.3 | 1278.2 | 1285.4 | 1299.7 | 1392.4 | 1538.6 | 1298.2 |
| 42.5° | 1276.9 | 1287.3 | 1333.6 | 1385.4 | 1400.3 | 1371.1 | 1382.5 | 1390.1 | 1469.8 | 1630.1 | 1372.1 |
| 45°   | 1326.6 | 1337.8 | 1402.0 | 1464.5 | 1499.4 | 1482.9 | 1501.1 | 1504.0 | 1567.1 | 1754.7 | 1479.4 |
| 47.5° | 1401.9 | 1414.6 | 1489.5 | 1555.1 | 1608.3 | 1610.0 | 1640.0 | 1638.9 | 1688.6 | 1897.3 | 1614.7 |
| 50°   | 1519.1 | 1537.5 | 1598.8 | 1660.1 | 1724.8 | 1760.7 | 1800.8 | 1795.2 | 1834.3 | 2049.2 | 1770.4 |
| 52.5° | 1672.7 | 1681.2 | 1726.7 | 1772.0 | 1852.2 | 1932.9 | 1990.4 | 1985.3 | 1999.5 | 2205.3 | 1947.2 |
| 55°   | 1831.9 | 1838.3 | 1857.1 | 1881.8 | 1989.8 | 2121.4 | 2242.9 | 2234.9 | 2199.1 | 2367.4 | 2121.9 |
| 57.5° | 1975.1 | 1988.1 | 2001.0 | 2011.3 | 2128.3 | 2318.3 | 2501.1 | 2501.7 | 2415.8 | 2542.3 | 2302.4 |
| 60°   | 1997.3 | 2008.8 | 2094.5 | 2175.3 | 2365.3 | 2581.0 | 2777.6 | 2771.8 | 2640.0 | 2732.1 | 2503.6 |
| 62.5° | 1765.6 | 1791.3 | 1934.5 | 2149.6 | 2593.6 | 3061.6 | 3130.3 | 3123.1 | 2908.2 | 2966.0 | 2737.9 |
| 65°   | 1265.3 | 1294.5 | 1467.2 | 1790.5 | 2482.9 | 3591.1 | 3766.8 | 3670.4 | 3273.8 | 3253.7 | 3012.3 |
| 67.5° | 729.9  | 736.9  | 811.8  | 1071.4 | 1890.6 | 3618.8 | 4737.8 | 4602.9 | 3841.7 | 3580.1 | 3146.5 |
| 70°   | 539.8  | 539.6  | 557.4  | 659.3  | 1023.0 | 2953.5 | 5199.6 | 5320.5 | 4439.5 | 3687.5 | 2956.7 |
| 71°   | 488.1  | 488.7  | 508.6  | 600.1  | 810.2  | 2472.1 | 5101.5 | 5366.2 | 4596.9 | 3634.5 | 2819.4 |
| 72.5° | 417.5  | 419.4  | 447.1  | 538.2  | 681.6  | 1704.8 | 4679.0 | 5092.2 | 4671.6 | 3503.7 | 2604.4 |
| 75°   | 316.7  | 321.2  | 359.5  | 453.7  | 623.0  | 864.6  | 3434.0 | 4066.3 | 4150.0 | 3091.6 | 1935.2 |
| 77.5° | 226.0  | 231.0  | 274.3  | 381.5  | 592.2  | 651.6  | 2299.7 | 2966.0 | 3054.1 | 1981.3 | 872.9  |
| 80°   | 142.8  | 148.8  | 181.5  | 303.5  | 556.4  | 618.7  | 1445.2 | 1993.7 | 1665.4 | 634.0  | 222.1  |
| 82.5° | 83.8   | 88.4   | 112.6  | 198.3  | 454.5  | 595.9  | 850.3  | 1105.1 | 648.1  | 191.5  | 101.0  |
| 85°   | 48.6   | 50.7   | 70.2   | 126.3  | 330.1  | 562.4  | 624.7  | 617.7  | 281.3  | 93.6   | 47.8   |
| 87.5° | 22.6   | 25.2   | 41.6   | 66.0   | 183.2  | 407.6  | 493.7  | 426.6  | 174.9  | 43.9   | 22.4   |
| 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: GWC-SA1C-722-U-SL3

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1538.8 | 1538.8 | 1538.8 | 1538.8 | 1538.8 | 1538.8 | 1538.8 | 1538.8 | 1538.8 | 1538.8 | 1538.8 |
| 2.5°  | 1525.5 | 1522.2 | 1508.5 | 1496.3 | 1483.5 | 1466.9 | 1448.5 | 1446.2 | 1434.9 | 1437.1 | 1433.2 |
| 5°    | 1495.3 | 1487.0 | 1453.9 | 1423.9 | 1388.5 | 1356.8 | 1322.3 | 1306.5 | 1283.6 | 1282.1 | 1276.3 |
| 7.5°  | 1452.2 | 1436.7 | 1385.4 | 1328.5 | 1271.7 | 1217.5 | 1163.9 | 1128.7 | 1092.7 | 1077.4 | 1076.1 |
| 10°   | 1403.6 | 1377.3 | 1301.8 | 1217.7 | 1135.6 | 1056.5 | 979.9  | 923.2  | 872.1  | 848.0  | 847.0  |
| 12.5° | 1357.6 | 1318.7 | 1215.2 | 1100.6 | 988.4  | 885.9  | 780.8  | 706.3  | 642.3  | 620.8  | 611.7  |
| 15°   | 1318.5 | 1263.7 | 1130.8 | 984.4  | 848.2  | 705.8  | 586.2  | 507.8  | 448.6  | 428.1  | 424.3  |
| 17.5° | 1280.6 | 1210.1 | 1044.3 | 866.9  | 702.3  | 545.8  | 426.0  | 367.8  | 336.2  | 327.9  | 327.7  |
| 20°   | 1242.8 | 1155.0 | 954.0  | 746.8  | 561.2  | 408.2  | 327.5  | 301.4  | 290.8  | 289.8  | 288.3  |
| 22.5° | 1200.1 | 1096.6 | 859.0  | 626.2  | 438.0  | 321.0  | 278.4  | 268.0  | 266.6  | 270.1  | 270.1  |
| 25°   | 1160.0 | 1038.5 | 762.6  | 508.2  | 340.7  | 267.8  | 248.6  | 246.5  | 250.2  | 256.3  | 256.9  |
| 27.5° | 1122.7 | 982.6  | 668.6  | 403.4  | 273.0  | 235.8  | 227.9  | 230.4  | 237.0  | 244.2  | 244.3  |
| 30°   | 1091.9 | 929.8  | 577.3  | 317.9  | 230.6  | 212.0  | 210.7  | 215.7  | 222.9  | 228.5  | 229.8  |
| 32.5° | 1068.1 | 884.7  | 489.1  | 255.6  | 202.9  | 194.2  | 195.4  | 199.7  | 204.1  | 207.2  | 209.3  |
| 35°   | 1057.1 | 846.0  | 407.6  | 215.5  | 185.3  | 180.5  | 182.1  | 184.4  | 186.3  | 188.6  | 190.4  |
| 37.5° | 1059.0 | 816.0  | 334.9  | 190.6  | 173.5  | 171.0  | 171.0  | 171.0  | 171.0  | 172.2  | 172.4  |
| 40°   | 1077.0 | 798.8  | 275.7  | 174.7  | 165.6  | 162.9  | 160.8  | 158.8  | 157.3  | 158.1  | 157.7  |
| 42.5° | 1123.1 | 797.3  | 232.4  | 164.6  | 159.2  | 154.8  | 150.5  | 147.8  | 145.9  | 146.6  | 147.0  |
| 45°   | 1201.2 | 816.6  | 203.1  | 157.5  | 153.2  | 146.5  | 141.0  | 138.1  | 136.8  | 139.3  | 139.7  |
| 47.5° | 1302.4 | 858.8  | 185.3  | 152.3  | 147.6  | 138.7  | 132.9  | 130.2  | 130.6  | 134.3  | 135.2  |
| 50°   | 1432.8 | 927.3  | 176.8  | 149.0  | 143.7  | 132.1  | 126.1  | 123.8  | 125.0  | 130.2  | 131.4  |
| 52.5° | 1576.0 | 1026.0 | 177.8  | 148.0  | 141.2  | 127.3  | 120.9  | 118.2  | 120.1  | 125.0  | 125.9  |
| 55°   | 1741.2 | 1144.5 | 193.9  | 149.4  | 137.6  | 124.2  | 116.7  | 112.0  | 113.6  | 118.0  | 118.8  |
| 57.5° | 1924.8 | 1280.4 | 226.2  | 149.0  | 132.9  | 121.3  | 112.2  | 105.2  | 106.4  | 109.1  | 109.9  |
| 60°   | 2115.9 | 1444.4 | 276.3  | 150.1  | 130.8  | 117.8  | 106.2  | 97.5   | 97.1   | 99.4   | 99.8   |
| 62.5° | 2345.4 | 1634.2 | 333.5  | 150.9  | 132.1  | 113.4  | 98.3   | 89.8   | 88.6   | 89.2   | 89.6   |
| 65°   | 2581.8 | 1771.6 | 312.1  | 147.8  | 136.4  | 109.7  | 91.3   | 82.2   | 80.1   | 79.7   | 79.9   |
| 67.5° | 2589.2 | 1624.3 | 218.8  | 141.6  | 138.1  | 107.8  | 86.1   | 75.8   | 72.4   | 71.0   | 70.8   |
| 70°   | 2322.0 | 1319.6 | 170.4  | 135.0  | 131.2  | 104.7  | 81.3   | 70.6   | 65.4   | 63.3   | 63.1   |
| 71°   | 2191.6 | 1214.8 | 161.5  | 131.8  | 125.9  | 101.6  | 79.1   | 68.3   | 62.9   | 60.6   | 60.2   |
| 72.5° | 1987.1 | 1089.0 | 150.7  | 126.5  | 115.9  | 93.6   | 75.1   | 65.0   | 59.4   | 56.7   | 56.1   |
| 75°   | 1426.0 | 712.1  | 129.4  | 112.8  | 96.0   | 74.7   | 65.8   | 58.4   | 53.6   | 50.3   | 49.9   |
| 77.5° | 549.4  | 283.4  | 97.9   | 93.8   | 73.5   | 58.4   | 54.2   | 50.5   | 47.0   | 43.7   | 43.5   |
| 80°   | 169.9  | 126.7  | 71.4   | 70.6   | 53.2   | 43.5   | 42.2   | 41.2   | 39.9   | 36.4   | 35.6   |
| 82.5° | 90.7   | 72.7   | 49.1   | 45.7   | 34.8   | 29.0   | 30.6   | 31.0   | 31.1   | 27.5   | 27.1   |
| 85°   | 43.3   | 38.5   | 27.7   | 25.9   | 20.3   | 16.3   | 18.8   | 20.3   | 20.5   | 16.8   | 15.7   |
| 87.5° | 20.7   | 20.1   | 13.0   | 9.9    | 7.5    | 5.4    | 6.6    | 8.1    | 8.9    | 6.4    | 5.6    |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

LM-79-08: Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Report Prepared for

Cooper Lighting Solutions

(formerly Eaton)

STREETWORKS

Report Number: SP1-2101-121-4

Luminaire Tested: IFLD-S-SA2B-722-U-T3R

Test Date: 03/03/2021

### Test Information

Test Method: LM-79-08  
 Report Number: SP1-2101-121-4  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1  
 Measurement Geometry:  $4\pi$   
 Issue Date: 03/03/2021  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: STREETWORKS  
 Catalog Number: **IFLD-S-SA2B-722-U-T3R**  
 Description: STREETWORKS INF FLOOD

PROGRAMMED @ 800mA.

### Spectral Parameters

|                           |         |           |      |      |       |
|---------------------------|---------|-----------|------|------|-------|
| CCT (K):                  | 2218    | CRI (Ra): | 72.2 |      |       |
| CIE u':                   | 0.2889  | R1:       | 69.1 | R9:  | -16.8 |
| CIE v':                   | 0.5350  | R2:       | 83.2 | R10: | 61.9  |
| Duv:                      | -0.0005 | R3:       | 95.4 | R11: | 60.1  |
| CIE x:                    | 0.5026  | R4:       | 66.4 | R12: | 51.2  |
| CIE y:                    | 0.4136  | R5:       | 66.2 | R13: | 71.3  |
| CIE z:                    | 0.0839  | R6:       | 76.7 | R14: | 97.1  |
| Peak Wavelength (nm):     | 606     | R7:       | 76.7 |      |       |
| Dominant Wavelength (nm): | 587     | R8:       | 43.9 |      |       |
| Purity:                   | 75.3    |           |      |      |       |
| Rf:                       | 70      |           |      |      |       |
| Rg:                       | 99.3    |           |      |      |       |



### Test Conditions

Stabilization Time: 95M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 25.3/31%  
 Sphere Temperature (°C): 24.8

REPORT NUMBER: SP1-2101-121-4

| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | IN0058                | 1/31/2021        | 7/31/2021            |
| Power Meter                    | IN0071                | 12/1/2020        | 12/1/2021            |
| AC Power Source                | IN0063                | 12/1/2020        | 12/1/2021            |
| DC Power Source                | IN0208                | 12/1/2020        | 12/1/2021            |
| Sphere Thermometer             | IN0085                | 12/1/2020        | 12/1/2021            |
| Room Thermometer               | IN0046                | 12/1/2020        | 12/1/2021            |

REPORT NUMBER: SP1-2101-121-4

**CIE 1931 Chromaticity Diagram**



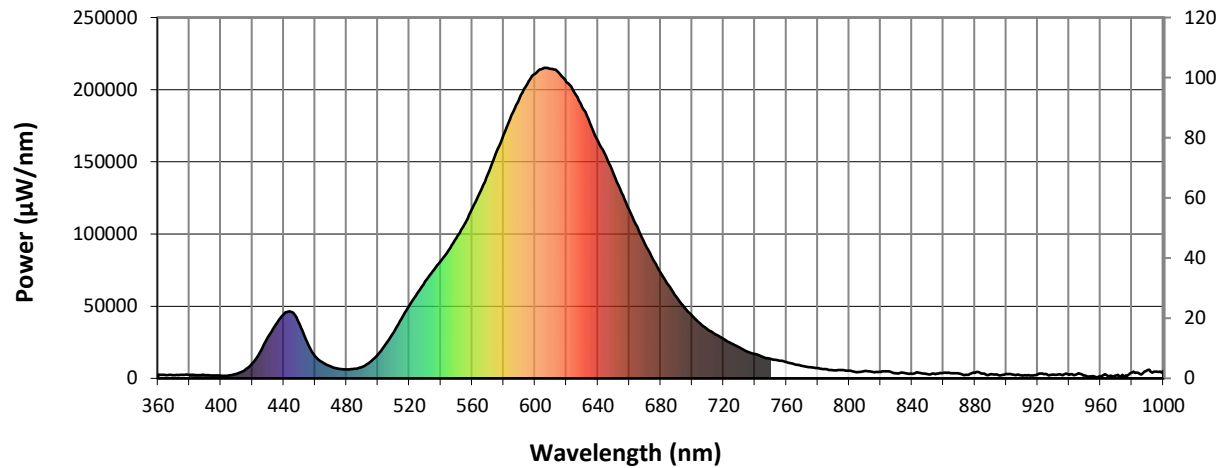
**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 2200K 4-step quadrangle

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### Photopic Flux vs. Wavelength



#####

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 2623             | 0.0              | 490       | 7941             | 1.1              | 620       | 205150           | 53.4             | 750       | 13431            | 0.0              | 880       | 3867             | 0.0              |
| 365       | 2260             | 0.0              | 495       | 11299            | 2.0              | 625       | 198277           | 43.7             | 755       | 12426            | 0.0              | 885       | 3345             | 0.0              |
| 370       | 2306             | 0.0              | 500       | 16633            | 3.7              | 630       | 187878           | 34.0             | 760       | 11385            | 0.0              | 890       | 2956             | 0.0              |
| 375       | 2437             | 0.0              | 505       | 23672            | 6.6              | 635       | 176836           | 26.6             | 765       | 9797             | 0.0              | 895       | 2272             | 0.0              |
| 380       | 2473             | 0.0              | 510       | 32025            | 11.0             | 640       | 164455           | 19.7             | 770       | 8562             | 0.0              | 900       | 3003             | 0.0              |
| 385       | 2203             | 0.0              | 515       | 41295            | 17.1             | 645       | 154086           | 14.8             | 775       | 7810             | 0.0              | 905       | 2480             | 0.0              |
| 390       | 2262             | 0.0              | 520       | 50628            | 24.6             | 650       | 141592           | 10.3             | 780       | 7052             | 0.0              | 910       | 2068             | 0.0              |
| 395       | 2028             | 0.0              | 525       | 58836            | 31.6             | 655       | 128604           | 7.4              | 785       | 6345             | 0.0              | 915       | 2064             | 0.0              |
| 400       | 1806             | 0.0              | 530       | 67109            | 39.5             | 660       | 116713           | 4.9              | 790       | 5524             | 0.0              | 920       | 2581             | 0.0              |
| 405       | 1945             | 0.0              | 535       | 74404            | 46.1             | 665       | 104993           | 3.3              | 795       | 5788             | 0.0              | 925       | 3137             | 0.0              |
| 410       | 3199             | 0.0              | 540       | 81280            | 53.0             | 670       | 93149            | 2.0              | 800       | 5282             | 0.0              | 930       | 2747             | 0.0              |
| 415       | 5572             | 0.0              | 545       | 88806            | 59.1             | 675       | 82543            | 1.4              | 805       | 4258             | 0.0              | 935       | 2471             | 0.0              |
| 420       | 10322            | 0.0              | 550       | 97367            | 66.2             | 680       | 73089            | 0.8              | 810       | 5156             | 0.0              | 940       | 2339             | 0.0              |
| 425       | 18494            | 0.1              | 555       | 106598           | 72.8             | 685       | 64438            | 0.6              | 815       | 4391             | 0.0              | 945       | 2917             | 0.0              |
| 430       | 28541            | 0.2              | 560       | 117615           | 79.9             | 690       | 56546            | 0.3              | 820       | 4383             | 0.0              | 950       | 1966             | 0.0              |
| 435       | 37453            | 0.4              | 565       | 129103           | 85.8             | 695       | 49328            | 0.2              | 825       | 4881             | 0.0              | 955       | 1580             | 0.0              |
| 440       | 44455            | 0.7              | 570       | 141415           | 92.0             | 700       | 43493            | 0.1              | 830       | 3588             | 0.0              | 960       | 1318             | 0.0              |
| 445       | 45934            | 1.0              | 575       | 155854           | 97.0             | 705       | 38035            | 0.1              | 835       | 3835             | 0.0              | 965       | 1419             | 0.0              |
| 450       | 37926            | 1.0              | 580       | 168613           | 100.2            | 710       | 33716            | 0.0              | 840       | 3014             | 0.0              | 970       | 1917             | 0.0              |
| 455       | 24793            | 0.8              | 585       | 182390           | 101.3            | 715       | 30449            | 0.0              | 845       | 3765             | 0.0              | 975       | 1210             | 0.0              |
| 460       | 15340            | 0.6              | 590       | 194054           | 100.3            | 720       | 27240            | 0.0              | 850       | 2906             | 0.0              | 980       | 3915             | 0.0              |
| 465       | 10883            | 0.6              | 595       | 203639           | 96.5             | 725       | 24231            | 0.0              | 855       | 2947             | 0.0              | 985       | 3180             | 0.0              |
| 470       | 8138             | 0.5              | 600       | 211043           | 91.0             | 730       | 21490            | 0.0              | 860       | 3864             | 0.0              | 990       | 5676             | 0.0              |
| 475       | 6653             | 0.5              | 605       | 214591           | 83.1             | 735       | 18548            | 0.0              | 865       | 3546             | 0.0              | 995       | 4736             | 0.0              |
| 480       | 6220             | 0.6              | 610       | 214337           | 73.6             | 740       | 16963            | 0.0              | 870       | 3253             | 0.0              | 1000      | 5113             | 0.0              |
| 485       | 6613             | 0.8              | 615       | 211915           | 64.0             | 745       | 14922            | 0.0              | 875       | 2450             | 0.0              |           |                  |                  |

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### Scotopic Flux vs. Wavelength



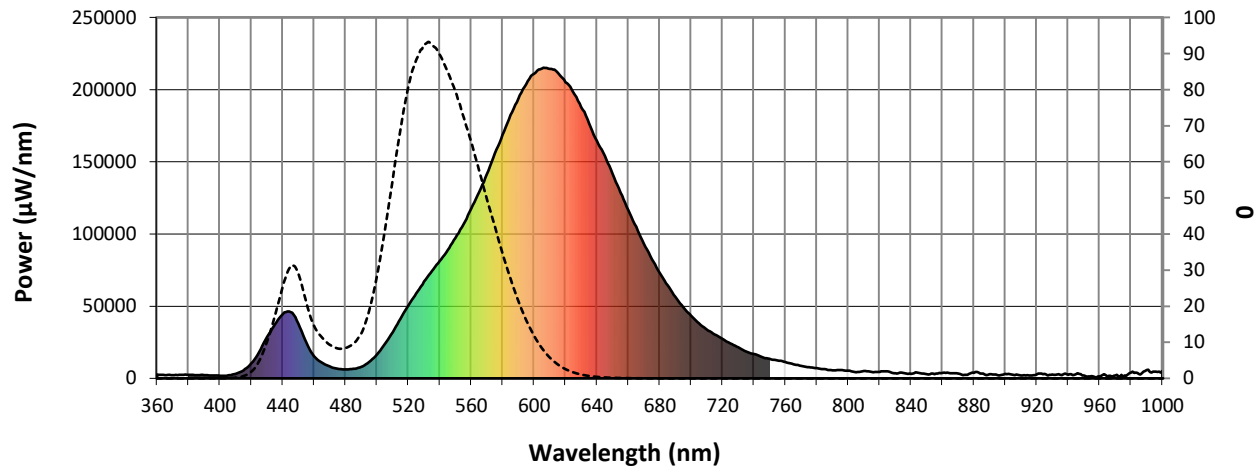
Scotopic Lumens: 7290.1

S/P: 0.84

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 2623             | 0.0              | 490       | 7941             | 12.2             | 620       | 205150           | 2.6              | 750       | 13431            | 0.0              | 880       | 3867             | 0.0              |
| 365       | 2260             | 0.0              | 495       | 11299            | 18.3             | 625       | 198277           | 1.7              | 755       | 12426            | 0.0              | 885       | 3345             | 0.0              |
| 370       | 2306             | 0.0              | 500       | 16633            | 27.8             | 630       | 187878           | 1.1              | 760       | 11385            | 0.0              | 890       | 2956             | 0.0              |
| 375       | 2437             | 0.0              | 505       | 23672            | 40.2             | 635       | 176836           | 0.7              | 765       | 9797             | 0.0              | 895       | 2272             | 0.0              |
| 380       | 2473             | 0.0              | 510       | 32025            | 54.3             | 640       | 164455           | 0.4              | 770       | 8562             | 0.0              | 900       | 3003             | 0.0              |
| 385       | 2203             | 0.0              | 515       | 41295            | 68.4             | 645       | 154086           | 0.3              | 775       | 7810             | 0.0              | 905       | 2480             | 0.0              |
| 390       | 2262             | 0.0              | 520       | 50628            | 80.5             | 650       | 141592           | 0.2              | 780       | 7052             | 0.0              | 910       | 2068             | 0.0              |
| 395       | 2028             | 0.0              | 525       | 58836            | 88.0             | 655       | 128604           | 0.1              | 785       | 6345             | 0.0              | 915       | 2064             | 0.0              |
| 400       | 1806             | 0.0              | 530       | 67109            | 92.5             | 660       | 116713           | 0.1              | 790       | 5524             | 0.0              | 920       | 2581             | 0.0              |
| 405       | 1945             | 0.1              | 535       | 74404            | 92.7             | 665       | 104993           | 0.0              | 795       | 5788             | 0.0              | 925       | 3137             | 0.0              |
| 410       | 3199             | 0.2              | 540       | 81280            | 89.8             | 670       | 93149            | 0.0              | 800       | 5282             | 0.0              | 930       | 2747             | 0.0              |
| 415       | 5572             | 0.6              | 545       | 88806            | 85.1             | 675       | 82543            | 0.0              | 805       | 4258             | 0.0              | 935       | 2471             | 0.0              |
| 420       | 10322            | 1.7              | 550       | 97367            | 79.6             | 680       | 73089            | 0.0              | 810       | 5156             | 0.0              | 940       | 2339             | 0.0              |
| 425       | 18494            | 4.5              | 555       | 106598           | 72.8             | 685       | 64438            | 0.0              | 815       | 4391             | 0.0              | 945       | 2917             | 0.0              |
| 430       | 28541            | 9.7              | 560       | 117615           | 65.7             | 690       | 56546            | 0.0              | 820       | 4383             | 0.0              | 950       | 1966             | 0.0              |
| 435       | 37453            | 16.7             | 565       | 129103           | 57.9             | 695       | 49328            | 0.0              | 825       | 4881             | 0.0              | 955       | 1580             | 0.0              |
| 440       | 44455            | 24.8             | 570       | 141415           | 49.9             | 700       | 43493            | 0.0              | 830       | 3588             | 0.0              | 960       | 1318             | 0.0              |
| 445       | 45934            | 30.8             | 575       | 155854           | 42.4             | 705       | 38035            | 0.0              | 835       | 3835             | 0.0              | 965       | 1419             | 0.0              |
| 450       | 37926            | 29.4             | 580       | 168613           | 34.7             | 710       | 33716            | 0.0              | 840       | 3014             | 0.0              | 970       | 1917             | 0.0              |
| 455       | 24793            | 21.7             | 585       | 182390           | 27.9             | 715       | 30449            | 0.0              | 845       | 3765             | 0.0              | 975       | 1210             | 0.0              |
| 460       | 15340            | 14.8             | 590       | 194054           | 21.6             | 720       | 27240            | 0.0              | 850       | 2906             | 0.0              | 980       | 3915             | 0.0              |
| 465       | 10883            | 11.5             | 595       | 203639           | 16.2             | 725       | 24231            | 0.0              | 855       | 2947             | 0.0              | 985       | 3180             | 0.0              |
| 470       | 8138             | 9.4              | 600       | 211043           | 11.9             | 730       | 21490            | 0.0              | 860       | 3864             | 0.0              | 990       | 5676             | 0.0              |
| 475       | 6653             | 8.3              | 605       | 214591           | 8.4              | 735       | 18548            | 0.0              | 865       | 3546             | 0.0              | 995       | 4736             | 0.0              |
| 480       | 6220             | 8.4              | 610       | 214337           | 5.8              | 740       | 16963            | 0.0              | 870       | 3253             | 0.0              | 1000      | 5113             | 0.0              |
| 485       | 6613             | 9.6              | 615       | 211915           | 3.9              | 745       | 14922            | 0.0              | 875       | 2450             | 0.0              |           |                  |                  |

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### Melanopic Flux vs. Wavelength



**Melanopic Lumens: 2276.7**

**M/P: 0.26**

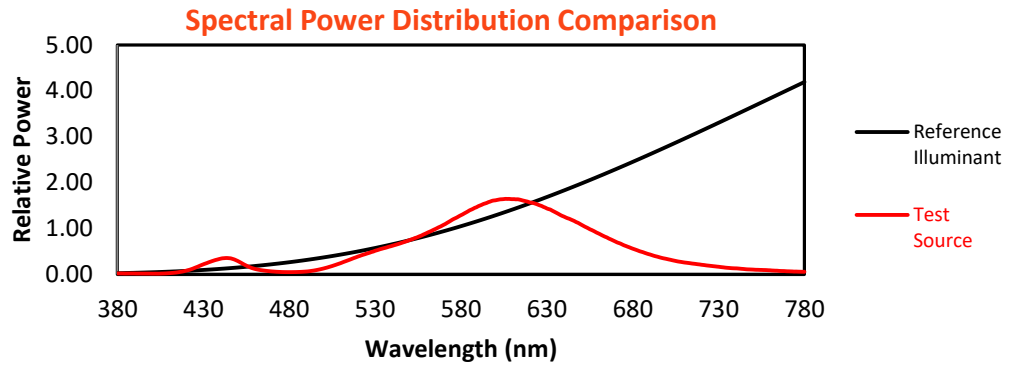
| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 2623             | 0.0              | 490       | 7941             | 6.6              | 620       | 205150           | 0.2              | 750       | 13431            | 0.0              | 880       | 3867             | 0.0              |
| 365       | 2260             | 0.0              | 495       | 11299            | 9.3              | 625       | 198277           | 0.1              | 755       | 12426            | 0.0              | 885       | 3345             | 0.0              |
| 370       | 2306             | 0.0              | 500       | 16633            | 13.4             | 630       | 187878           | 0.1              | 760       | 11385            | 0.0              | 890       | 2956             | 0.0              |
| 375       | 2437             | 0.0              | 505       | 23672            | 18.2             | 635       | 176836           | 0.0              | 765       | 9797             | 0.0              | 895       | 2272             | 0.0              |
| 380       | 2473             | 0.0              | 510       | 32025            | 23.0             | 640       | 164455           | 0.0              | 770       | 8562             | 0.0              | 900       | 3003             | 0.0              |
| 385       | 2203             | 0.0              | 515       | 41295            | 27.0             | 645       | 154086           | 0.0              | 775       | 7810             | 0.0              | 905       | 2480             | 0.0              |
| 390       | 2262             | 0.0              | 520       | 50628            | 29.5             | 650       | 141592           | 0.0              | 780       | 7052             | 0.0              | 910       | 2068             | 0.0              |
| 395       | 2028             | 0.0              | 525       | 58836            | 29.8             | 655       | 128604           | 0.0              | 785       | 6345             | 0.0              | 915       | 2064             | 0.0              |
| 400       | 1806             | 0.0              | 530       | 67109            | 29.0             | 660       | 116713           | 0.0              | 790       | 5524             | 0.0              | 920       | 2581             | 0.0              |
| 405       | 1945             | 0.0              | 535       | 74404            | 26.8             | 665       | 104993           | 0.0              | 795       | 5788             | 0.0              | 925       | 3137             | 0.0              |
| 410       | 3199             | 0.1              | 540       | 81280            | 23.8             | 670       | 93149            | 0.0              | 800       | 5282             | 0.0              | 930       | 2747             | 0.0              |
| 415       | 5572             | 0.4              | 545       | 88806            | 20.6             | 675       | 82543            | 0.0              | 805       | 4258             | 0.0              | 935       | 2471             | 0.0              |
| 420       | 10322            | 1.2              | 550       | 97367            | 17.5             | 680       | 73089            | 0.0              | 810       | 5156             | 0.0              | 940       | 2339             | 0.0              |
| 425       | 18494            | 2.9              | 555       | 106598           | 14.4             | 685       | 64438            | 0.0              | 815       | 4391             | 0.0              | 945       | 2917             | 0.0              |
| 430       | 28541            | 6.0              | 560       | 117615           | 11.6             | 690       | 56546            | 0.0              | 820       | 4383             | 0.0              | 950       | 1966             | 0.0              |
| 435       | 37453            | 10.0             | 565       | 129103           | 9.1              | 695       | 49328            | 0.0              | 825       | 4881             | 0.0              | 955       | 1580             | 0.0              |
| 440       | 44455            | 14.9             | 570       | 141415           | 6.9              | 700       | 43493            | 0.0              | 830       | 3588             | 0.0              | 960       | 1318             | 0.0              |
| 445       | 45934            | 18.1             | 575       | 155854           | 5.2              | 705       | 38035            | 0.0              | 835       | 3835             | 0.0              | 965       | 1419             | 0.0              |
| 450       | 37926            | 17.5             | 580       | 168613           | 3.8              | 710       | 33716            | 0.0              | 840       | 3014             | 0.0              | 970       | 1917             | 0.0              |
| 455       | 24793            | 13.0             | 585       | 182390           | 2.7              | 715       | 30449            | 0.0              | 845       | 3765             | 0.0              | 975       | 1210             | 0.0              |
| 460       | 15340            | 9.0              | 590       | 194054           | 1.9              | 720       | 27240            | 0.0              | 850       | 2906             | 0.0              | 980       | 3915             | 0.0              |
| 465       | 10883            | 7.1              | 595       | 203639           | 1.3              | 725       | 24231            | 0.0              | 855       | 2947             | 0.0              | 985       | 3180             | 0.0              |
| 470       | 8138             | 5.8              | 600       | 211043           | 0.9              | 730       | 21490            | 0.0              | 860       | 3864             | 0.0              | 990       | 5676             | 0.0              |
| 475       | 6653             | 5.1              | 605       | 214591           | 0.6              | 735       | 18548            | 0.0              | 865       | 3546             | 0.0              | 995       | 4736             | 0.0              |
| 480       | 6220             | 5.0              | 610       | 214337           | 0.4              | 740       | 16963            | 0.0              | 870       | 3253             | 0.0              | 1000      | 5113             | 0.0              |
| 485       | 6613             | 5.5              | 615       | 211915           | 0.3              | 745       | 14922            | 0.0              | 875       | 2450             | 0.0              |           |                  |                  |

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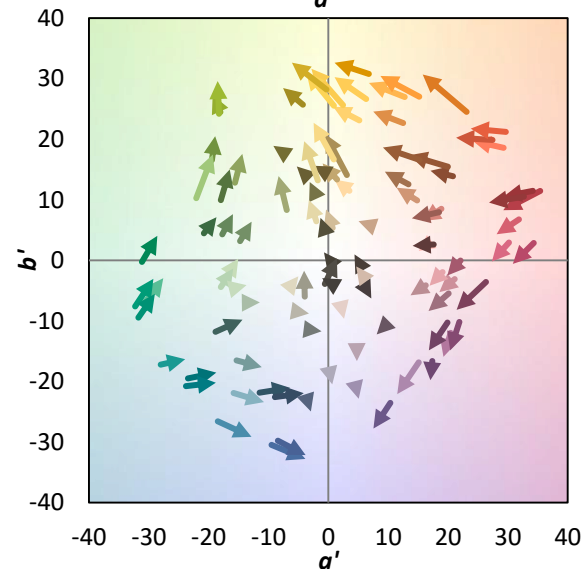
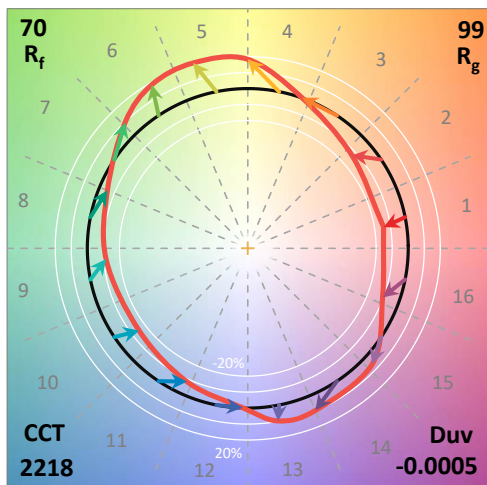
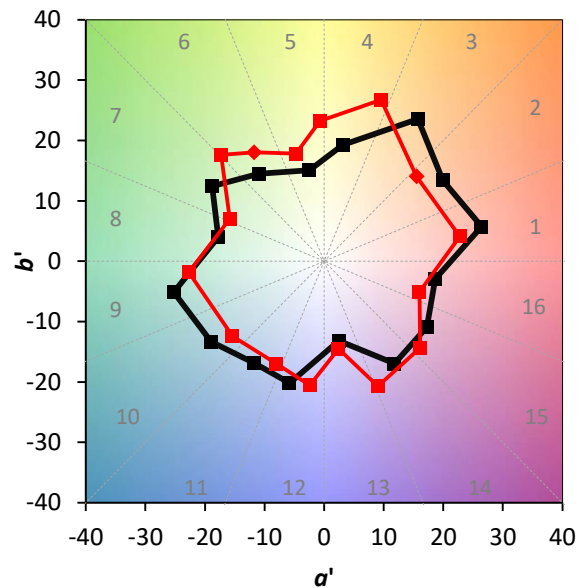
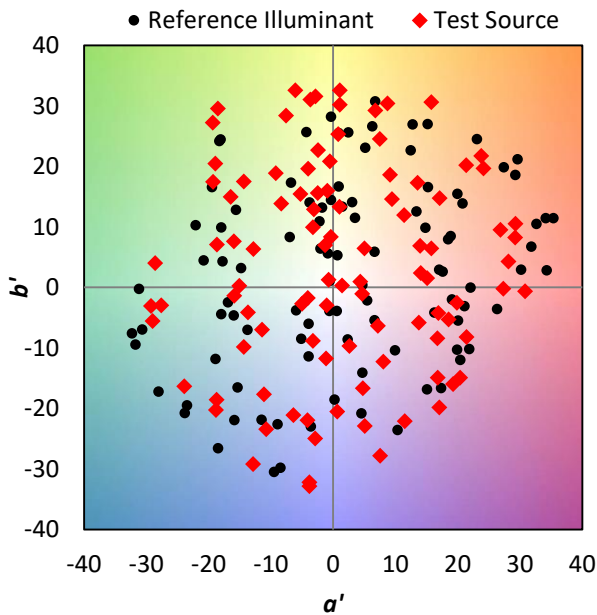
TM-30-18

### Summary

$R_f = 70$   
 $R_g = 99.3$   
 CIE  $R_a = 72.2$   
 $R_g = -16.8$

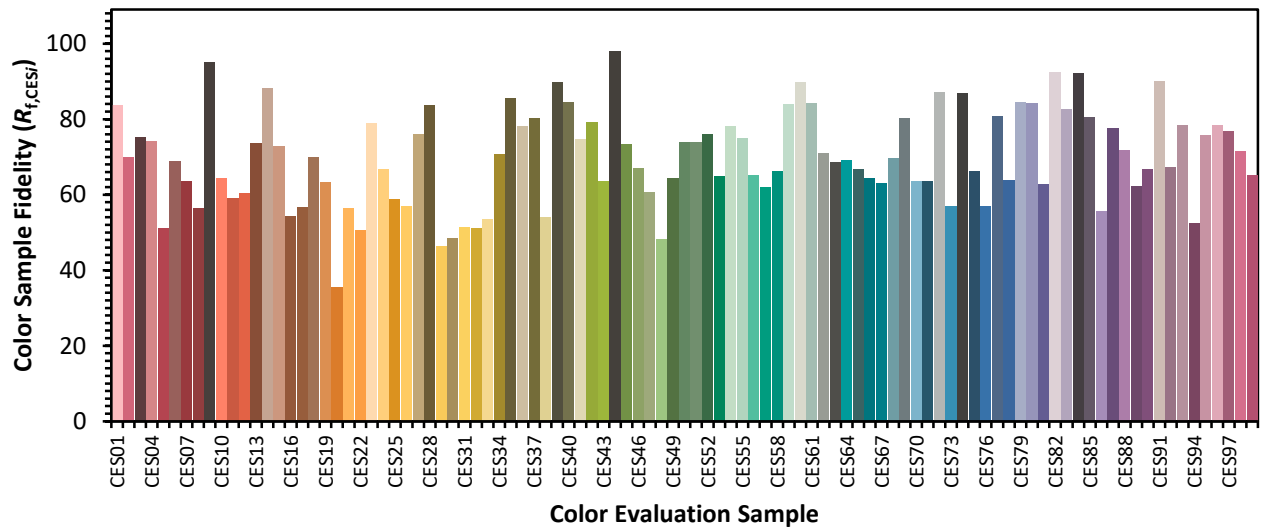


### Color Vector Graphics

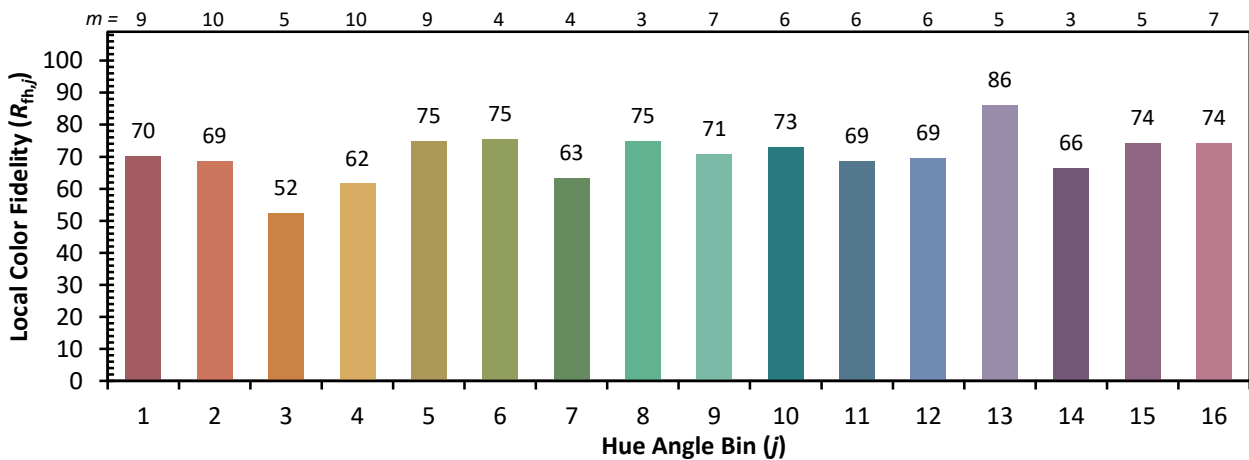
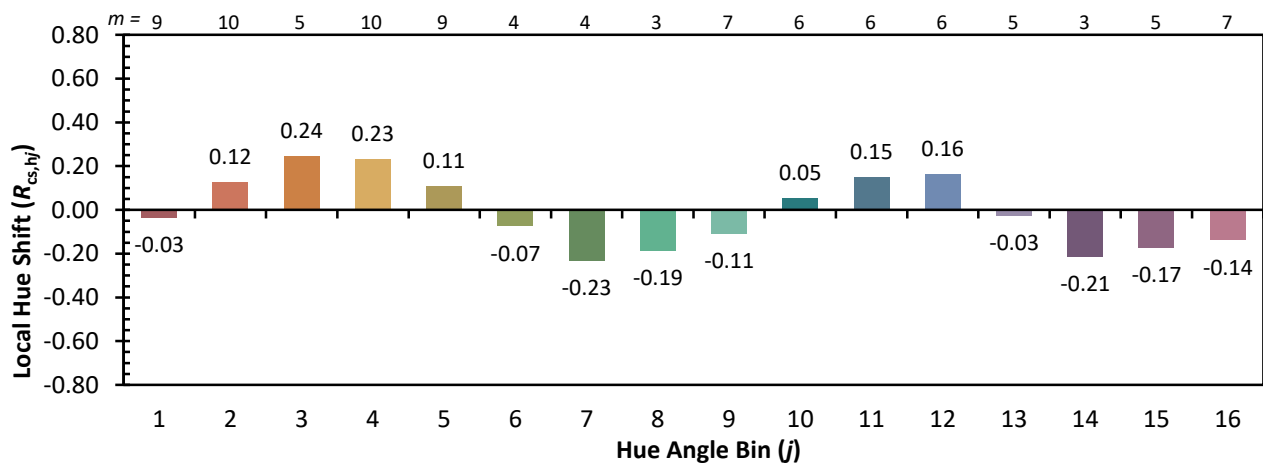
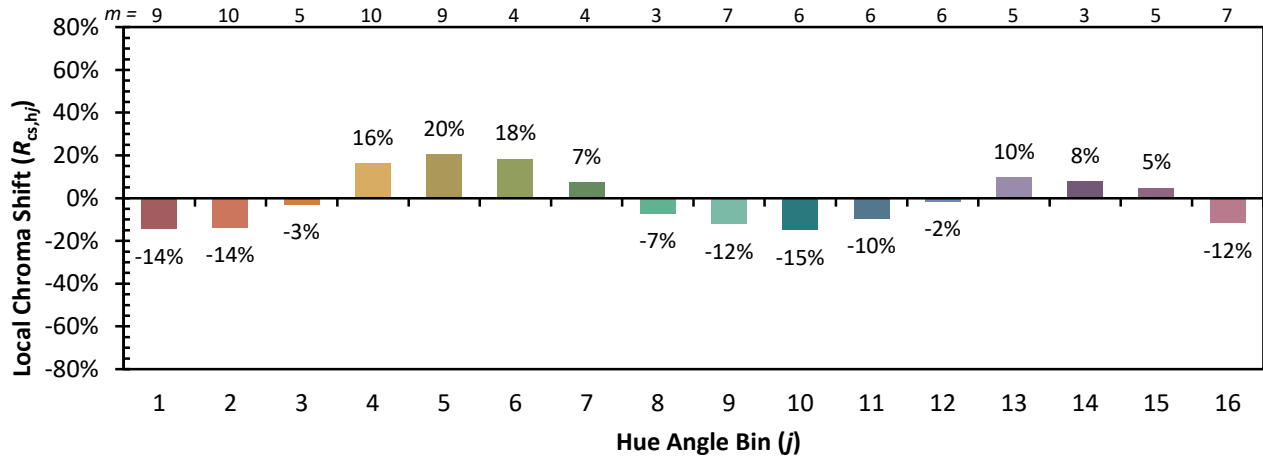


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 87 | CES26 = 57 | CES51 = 74 | CES76 = 57 |
| CES02 = 65 | CES27 = 76 | CES52 = 76 | CES77 = 81 |
| CES03 = 32 | CES28 = 84 | CES53 = 65 | CES78 = 64 |
| CES04 = 72 | CES29 = 46 | CES54 = 78 | CES79 = 85 |
| CES05 = 52 | CES30 = 48 | CES55 = 75 | CES80 = 84 |
| CES06 = 52 | CES31 = 52 | CES56 = 65 | CES81 = 63 |
| CES07 = 44 | CES32 = 51 | CES57 = 62 | CES82 = 92 |
| CES08 = 43 | CES33 = 54 | CES58 = 66 | CES83 = 83 |
| CES09 = 29 | CES34 = 71 | CES59 = 84 | CES84 = 92 |
| CES10 = 79 | CES35 = 86 | CES60 = 90 | CES85 = 81 |
| CES11 = 62 | CES36 = 78 | CES61 = 84 | CES86 = 56 |
| CES12 = 68 | CES37 = 80 | CES62 = 71 | CES87 = 78 |
| CES13 = 45 | CES38 = 54 | CES63 = 68 | CES88 = 72 |
| CES14 = 75 | CES39 = 90 | CES64 = 69 | CES89 = 62 |
| CES15 = 72 | CES40 = 85 | CES65 = 67 | CES90 = 67 |
| CES16 = 49 | CES41 = 75 | CES66 = 64 | CES91 = 90 |
| CES17 = 51 | CES42 = 79 | CES67 = 63 | CES92 = 67 |
| CES18 = 57 | CES43 = 64 | CES68 = 70 | CES93 = 78 |
| CES19 = 74 | CES44 = 98 | CES69 = 80 | CES94 = 52 |
| CES20 = 68 | CES45 = 73 | CES70 = 64 | CES95 = 76 |
| CES21 = 89 | CES46 = 67 | CES71 = 64 | CES96 = 78 |
| CES22 = 81 | CES47 = 61 | CES72 = 87 | CES97 = 77 |
| CES23 = 92 | CES48 = 48 | CES73 = 57 | CES98 = 72 |
| CES24 = 92 | CES49 = 64 | CES74 = 87 | CES99 = 65 |
| CES25 = 74 | CES50 = 74 | CES75 = 66 |            |



Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)