

Signify Classified - Internal  
Cooper Lighting Solutions Photometric Lab  
1121 Highway 74 South  
Peachtree City, GA 30269



Scaled data based on original data using  
LM-79-08 Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Test Report Prepared for  
Cooper Lighting Solutions  
(formerly Eaton)

Brand: STREETWORKS

Report Number: P800912

Luminaire Tested: **ARCH-M-PA2-70-750-24VDC-T4W**

Issue Date: 5/19/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P800912  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1910-568-11)  
Test Lab: INNOVATION CENTER  
Issue Date: 5/19/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: STREETWORKS  
Catalog Number: ARCH-M-PA2-70-750-24VDC-T4W  
Description: ARCHEON-M ROADWAY AND AREA LUMINAIRE  
(2) 70 CRI, 5000K, 470mA LIGHT ENGINES WITH 16 LEDS AND TYPE IV WIDE OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 11755 lumens  
Efficiency: N/A  
Efficacy: 165.6 lumens/watt  
Luminous Opening: Rectangular (W 0.75' x L: 1' x H: 0')  
IES Classification: Type IV - Medium  
BUG Rating: B2 - U0 - G3

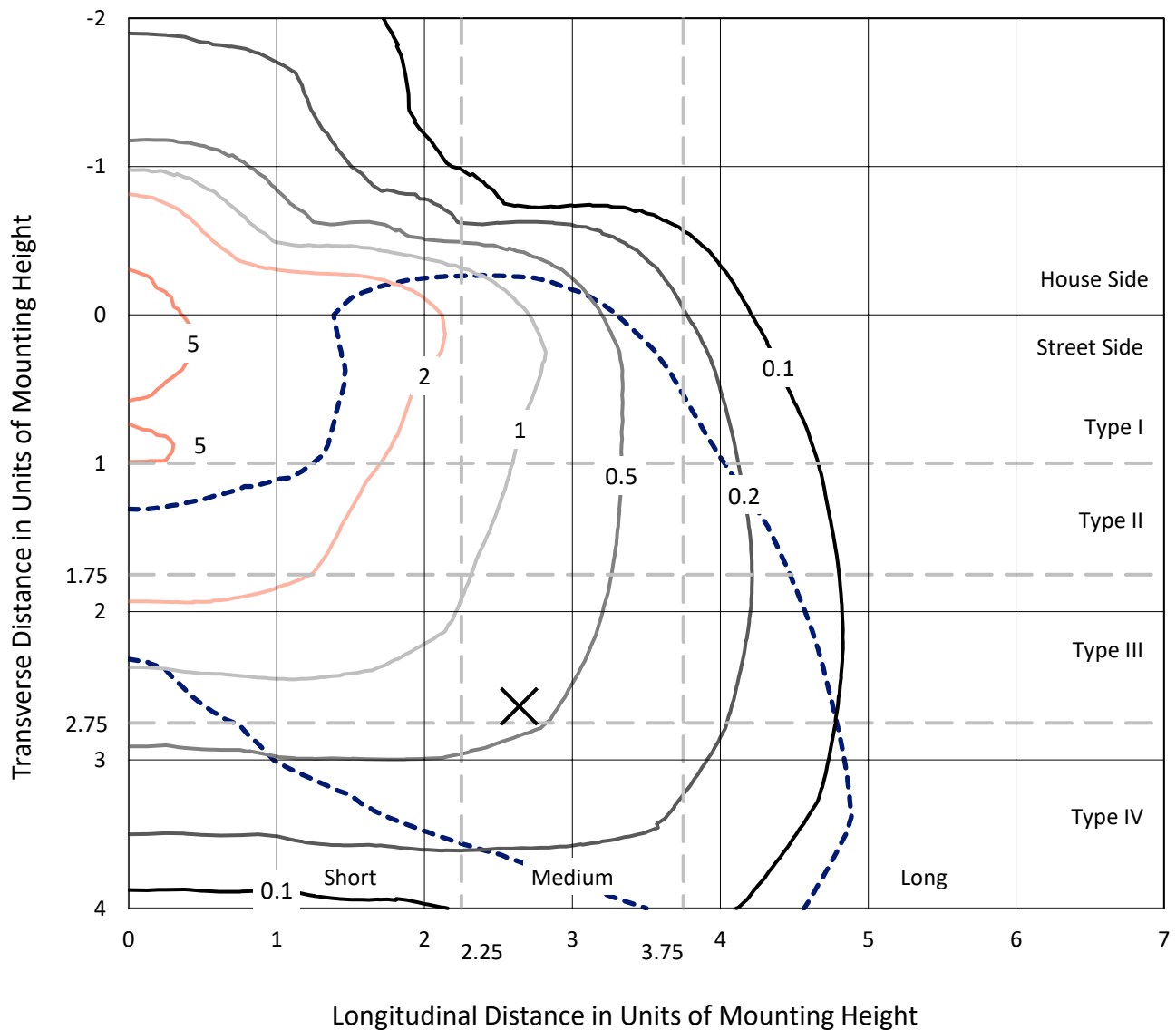
Input Watts (W): 71  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 25 FT

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## Iso-Footcandle Lines of Horizontal Illumination

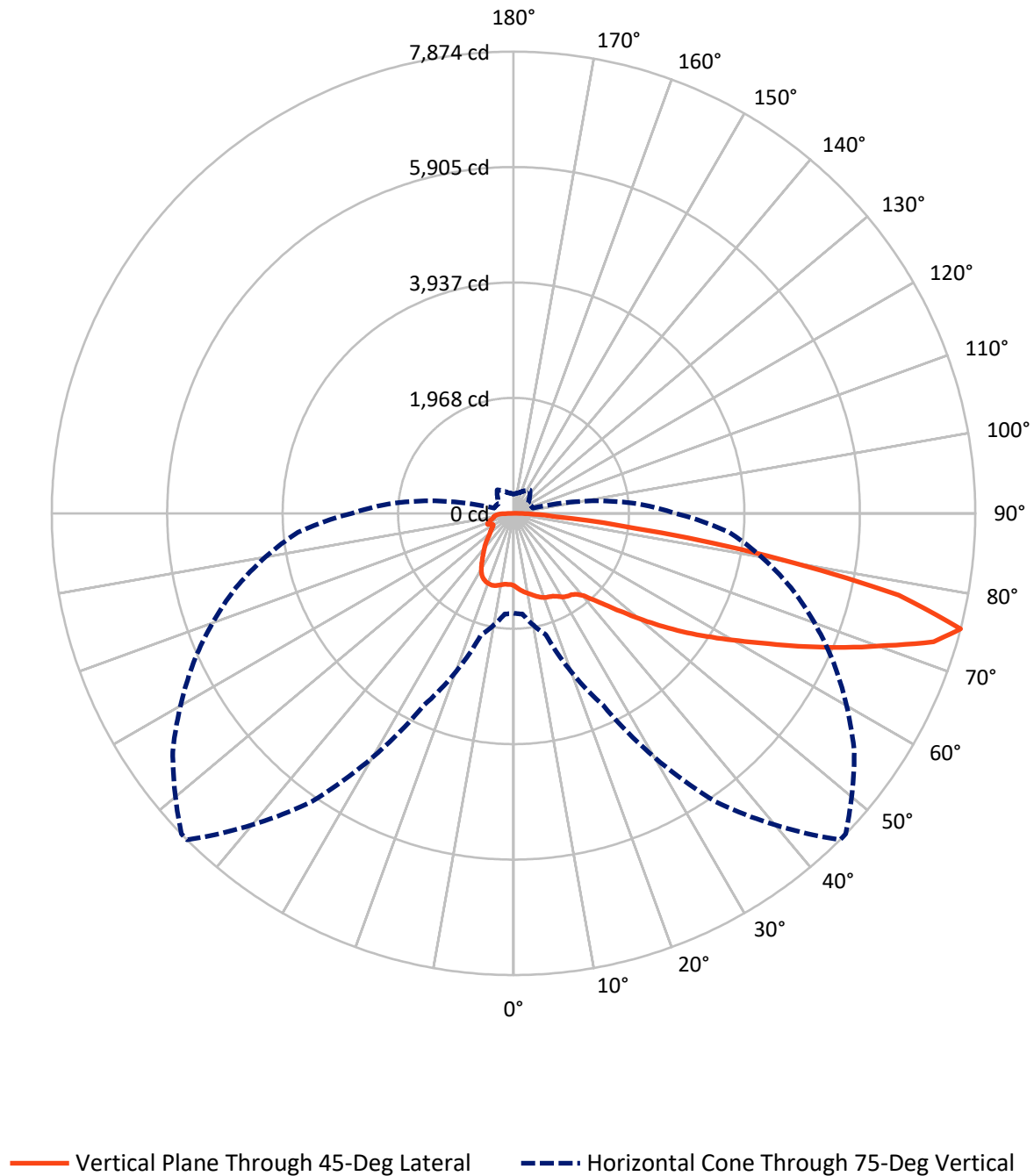
× Max cd  
 - - - 1/2 Max cd



Based on 15 foot mounting height. Maximum calculated value = 6.5 fc  
 Type IV - Medium - N/A

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## Luminous Intensity Polar Plot



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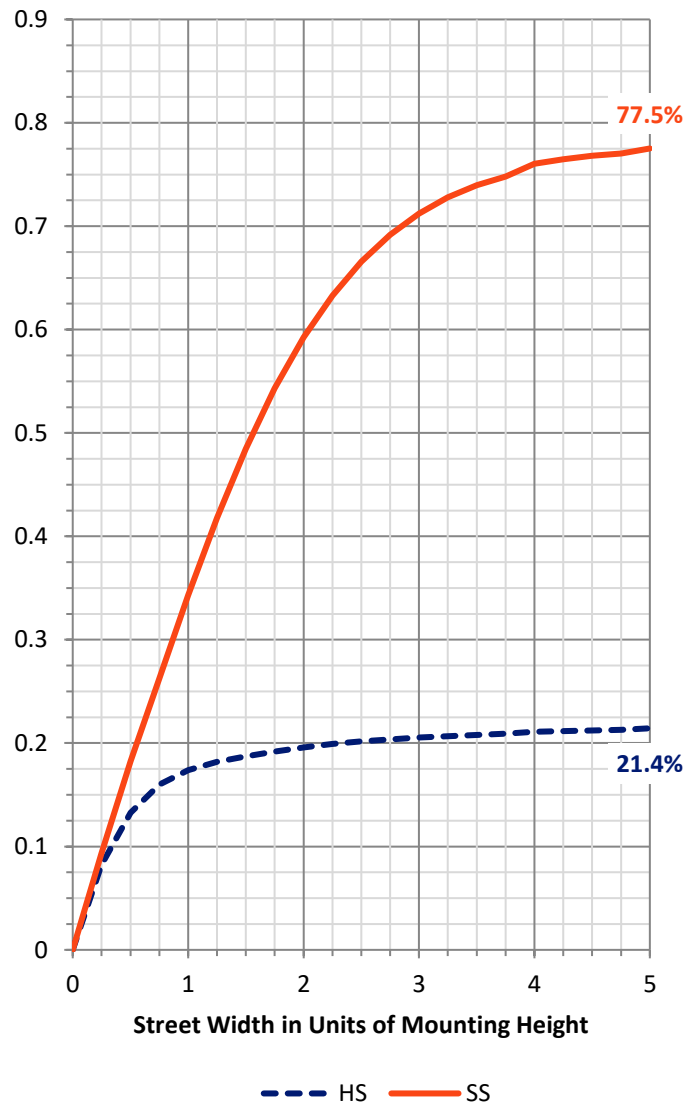
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 2597.8   | 0.0    | 2597.8  |
|                    | % Fixture | 22.1     | 0.0    | 22.1    |
| <b>Street Side</b> | Lumens    | 9157.2   | 0.0    | 9157.2  |
|                    | % Fixture | 77.9     | 0.0    | 77.9    |
| <b>Total</b>       | Lumens    | 11755.0  | 0.0    | 11755.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**Coefficient of Utilization**

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 122.1   | 1.0       |
| 10°-20°   | 388.5   | 3.3       |
| 20°-30°   | 662.4   | 5.6       |
| 30°-40°   | 928.1   | 7.9       |
| 40°-50°   | 1363.5  | 11.6      |
| 50°-60°   | 2170.1  | 18.5      |
| 60°-70°   | 3086.9  | 26.3      |
| 70°-80°   | 2584.7  | 22.0      |
| 80°-90°   | 448.6   | 3.8       |
| 90°-100°  | 0.0     | 0.0       |
| 100°-110° | 0.0     | 0.0       |
| 110°-120° | 0.0     | 0.0       |
| 120°-130° | 0.0     | 0.0       |
| 130°-140° | 0.0     | 0.0       |
| 140°-150° | 0.0     | 0.0       |
| 150°-160° | 0.0     | 0.0       |
| 160°-170° | 0.0     | 0.0       |
| 170°-180° | 0.0     | 0.0       |
| 0°-90°    | 11755.0 | 100.0     |
| 0°-180°   | 11755.0 | 100.0     |



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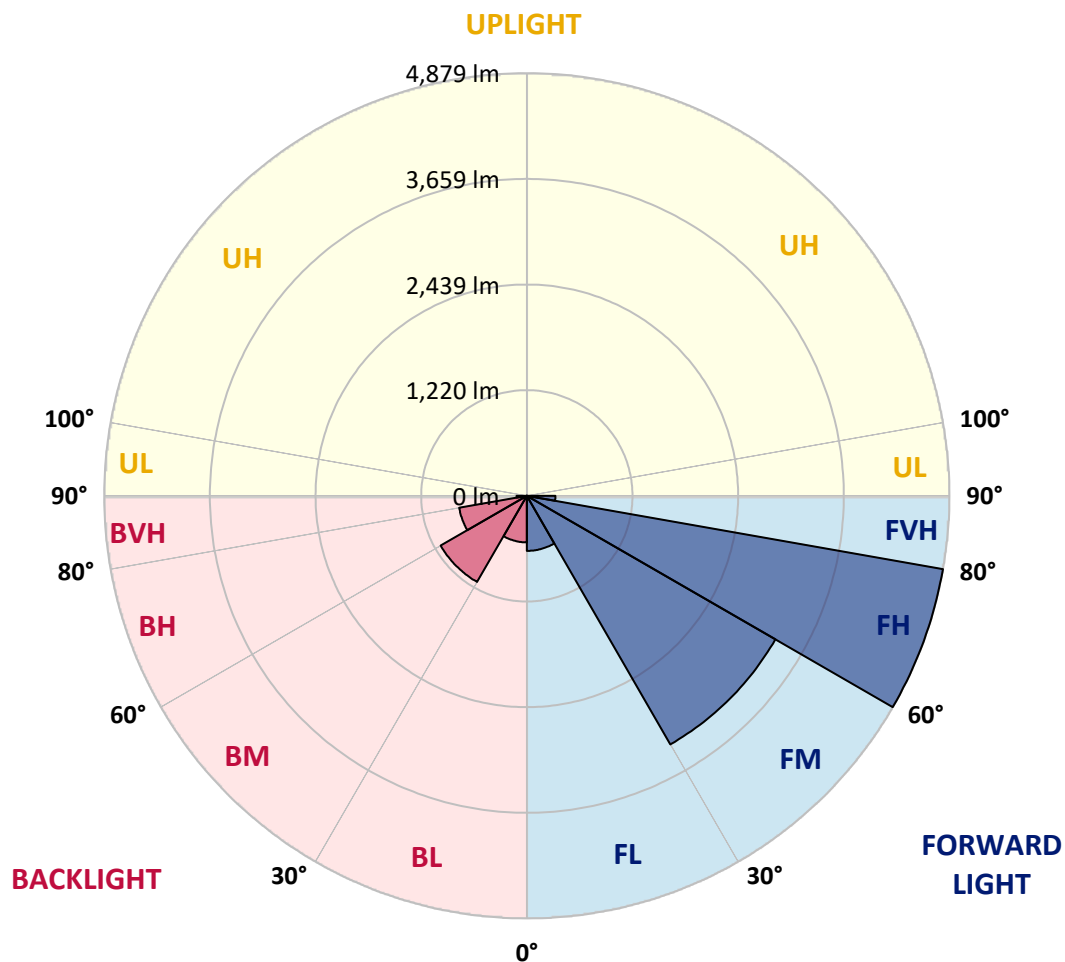
CATALOG NUMBER: ARCH-M-PA2-70-750-24VDC-T4W

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 635.4  | 5.4       |                         |      |         |
| FM   | (30°-60°)   | 3313.4 | 28.2      |                         |      |         |
| FH   | (60°-80°)   | 4878.6 | 41.5      |                         |      | G2/5000 |
| FVH  | (80°-90°)   | 329.8  | 2.8       |                         |      | G3/500  |
| BL   | (0°-30°)    | 537.6  | 4.6       | B2/1000                 |      |         |
| BM   | (30°-60°)   | 1148.3 | 9.8       | B2/2500                 |      |         |
| BH   | (60°-80°)   | 793.0  | 6.7       | B2/1000                 |      | G2/1000 |
| BVH  | (80°-90°)   | 118.8  | 1.0       |                         |      | G2/225  |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B2-U0-G3**

Type IV Medium





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CATALOG NUMBER: ARCH-M-PA2-70-750-24VDC-T4W

**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 46°    | 55°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1234.5 | 1234.5 | 1234.5 | 1234.5 | 1234.5 | 1234.5 | 1234.5 | 1234.5 | 1234.5 | 1234.5 | 1234.5 |
| 2.5°  | 1305.2 | 1298.9 | 1295.8 | 1295.8 | 1283.2 | 1275.4 | 1273.8 | 1262.8 | 1253.4 | 1244.0 | 1236.1 |
| 5°    | 1380.6 | 1375.9 | 1366.5 | 1358.6 | 1341.3 | 1319.3 | 1316.2 | 1292.6 | 1269.1 | 1247.1 | 1228.2 |
| 7.5°  | 1449.7 | 1440.3 | 1429.3 | 1413.6 | 1385.3 | 1355.5 | 1350.8 | 1317.8 | 1284.8 | 1251.8 | 1226.7 |
| 10°   | 1507.8 | 1498.4 | 1482.7 | 1460.7 | 1424.6 | 1388.5 | 1383.7 | 1349.2 | 1314.6 | 1275.4 | 1239.2 |
| 12.5° | 1562.8 | 1554.9 | 1531.4 | 1501.5 | 1459.1 | 1426.2 | 1421.4 | 1391.6 | 1355.5 | 1311.5 | 1264.4 |
| 15°   | 1609.9 | 1602.1 | 1576.9 | 1542.4 | 1493.7 | 1468.6 | 1462.3 | 1434.0 | 1397.9 | 1350.8 | 1302.1 |
| 17.5° | 1633.5 | 1633.5 | 1606.8 | 1569.1 | 1523.5 | 1504.7 | 1500.0 | 1465.4 | 1432.4 | 1386.9 | 1338.2 |
| 20°   | 1641.3 | 1644.5 | 1625.6 | 1580.1 | 1540.8 | 1533.0 | 1528.2 | 1500.0 | 1462.3 | 1418.3 | 1372.7 |
| 22.5° | 1646.0 | 1652.3 | 1636.6 | 1584.8 | 1551.8 | 1547.1 | 1544.0 | 1525.1 | 1495.3 | 1452.9 | 1407.3 |
| 25°   | 1661.7 | 1661.7 | 1650.8 | 1592.6 | 1565.9 | 1564.4 | 1564.4 | 1553.4 | 1533.0 | 1496.8 | 1451.3 |
| 27.5° | 1685.3 | 1683.7 | 1669.6 | 1609.9 | 1597.4 | 1602.1 | 1600.5 | 1598.9 | 1584.8 | 1548.7 | 1500.0 |
| 30°   | 1724.6 | 1724.6 | 1708.9 | 1644.5 | 1636.6 | 1657.0 | 1658.6 | 1661.7 | 1639.8 | 1583.2 | 1544.0 |
| 32.5° | 1784.3 | 1778.0 | 1762.3 | 1679.0 | 1666.5 | 1685.3 | 1688.5 | 1686.9 | 1668.0 | 1614.6 | 1595.8 |
| 35°   | 1968.0 | 1953.9 | 1897.3 | 1756.0 | 1693.2 | 1704.2 | 1705.7 | 1713.6 | 1716.7 | 1674.3 | 1664.9 |
| 37.5° | 2290.0 | 2271.2 | 2184.8 | 1938.2 | 1778.0 | 1751.3 | 1749.7 | 1770.1 | 1787.4 | 1749.7 | 1749.7 |
| 40°   | 2640.3 | 2624.6 | 2574.3 | 2252.3 | 1935.0 | 1847.1 | 1840.8 | 1859.7 | 1881.6 | 1854.9 | 1862.8 |
| 42.5° | 2941.8 | 2954.4 | 2959.1 | 2585.3 | 2170.6 | 2026.1 | 2008.9 | 1982.2 | 2016.7 | 1993.2 | 2024.6 |
| 45°   | 3168.0 | 3161.7 | 3248.1 | 2926.1 | 2475.3 | 2250.7 | 2227.2 | 2154.9 | 2198.9 | 2197.3 | 2266.5 |
| 47.5° | 3408.3 | 3397.3 | 3433.4 | 3246.5 | 2822.5 | 2525.6 | 2489.5 | 2382.7 | 2448.6 | 2494.2 | 2608.9 |
| 50°   | 3636.1 | 3639.2 | 3651.8 | 3499.4 | 3199.4 | 2860.2 | 2814.6 | 2671.7 | 2765.9 | 2861.7 | 3023.5 |
| 52.5° | 3932.9 | 3910.9 | 3895.2 | 3794.7 | 3621.9 | 3208.8 | 3179.0 | 3015.7 | 3147.6 | 3260.7 | 3475.9 |
| 55°   | 4192.1 | 4177.9 | 4168.5 | 4163.8 | 3975.3 | 3593.7 | 3562.2 | 3392.6 | 3582.7 | 3662.8 | 3980.0 |
| 57.5° | 4468.5 | 4460.7 | 4510.9 | 4591.0 | 4515.6 | 3984.7 | 3951.8 | 3788.4 | 4000.4 | 4057.0 | 4526.6 |
| 60°   | 4671.1 | 4675.8 | 4814.0 | 5018.2 | 4966.4 | 4408.8 | 4369.6 | 4225.1 | 4407.2 | 4457.5 | 5073.2 |
| 62.5° | 4672.7 | 4719.8 | 5040.2 | 5406.2 | 5465.9 | 4897.3 | 4851.7 | 4694.7 | 4825.0 | 4825.0 | 5563.2 |
| 65°   | 4226.6 | 4280.0 | 4999.4 | 5502.0 | 5971.6 | 5478.4 | 5434.5 | 5187.9 | 5236.6 | 5170.6 | 6023.4 |
| 67.5° | 3782.1 | 3845.0 | 4521.9 | 5509.8 | 6326.6 | 6100.4 | 6048.6 | 5681.0 | 5597.8 | 5431.3 | 6345.4 |
| 70°   | 3486.8 | 3530.8 | 4096.3 | 5407.8 | 6540.2 | 6750.7 | 6711.4 | 6149.1 | 5882.1 | 5649.6 | 6277.9 |
| 72.5° | 2935.5 | 2919.8 | 3460.1 | 4922.4 | 6659.6 | 7488.9 | 7455.9 | 6658.0 | 6128.7 | 5546.0 | 5354.4 |
| 75°   | 1704.2 | 1723.0 | 2147.1 | 3606.2 | 6003.0 | 7873.7 | 7870.5 | 7093.1 | 6020.3 | 4898.9 | 3689.5 |
| 77.5° | 491.6  | 505.7  | 705.2  | 1584.8 | 3796.3 | 6716.1 | 6931.3 | 6486.8 | 5088.9 | 3491.6 | 1913.1 |
| 80°   | 215.2  | 226.2  | 306.3  | 527.7  | 1635.0 | 4386.8 | 4575.3 | 4386.8 | 3069.1 | 1602.1 | 750.8  |
| 82.5° | 127.2  | 135.1  | 199.5  | 326.7  | 783.8  | 2087.4 | 2341.8 | 2045.0 | 1324.1 | 680.1  | 311.0  |
| 85°   | 72.2   | 75.4   | 114.7  | 207.3  | 493.2  | 730.4  | 819.9  | 768.0  | 645.5  | 386.4  | 163.3  |
| 87.5° | 33.0   | 34.6   | 56.5   | 97.4   | 276.4  | 246.6  | 256.0  | 339.3  | 373.8  | 235.6  | 81.7   |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |



REPORT NUMBER: P800912

CATALOG NUMBER: ARCH-M-PA2-70-750-24VDC-T4W

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1234.5 | 1234.5 | 1234.5 | 1234.5 | 1234.5 | 1234.5 | 1234.5 | 1234.5 | 1234.5 | 1234.5 | 1234.5 |
| 2.5°  | 1233.0 | 1228.2 | 1218.8 | 1215.7 | 1211.0 | 1212.5 | 1214.1 | 1214.1 | 1215.7 | 1211.0 | 1211.0 |
| 5°    | 1220.4 | 1212.5 | 1203.1 | 1203.1 | 1203.1 | 1215.7 | 1226.7 | 1233.0 | 1236.1 | 1236.1 | 1233.0 |
| 7.5°  | 1215.7 | 1206.3 | 1195.3 | 1198.4 | 1201.5 | 1217.3 | 1237.7 | 1258.1 | 1264.4 | 1264.4 | 1261.2 |
| 10°   | 1225.1 | 1215.7 | 1207.8 | 1212.5 | 1220.4 | 1233.0 | 1248.7 | 1267.5 | 1283.2 | 1284.8 | 1283.2 |
| 12.5° | 1247.1 | 1236.1 | 1228.2 | 1237.7 | 1247.1 | 1255.0 | 1262.8 | 1270.7 | 1291.1 | 1294.2 | 1294.2 |
| 15°   | 1283.2 | 1272.2 | 1262.8 | 1270.7 | 1273.8 | 1273.8 | 1273.8 | 1273.8 | 1294.2 | 1297.4 | 1297.4 |
| 17.5° | 1319.3 | 1309.9 | 1300.5 | 1302.1 | 1292.6 | 1280.1 | 1275.4 | 1273.8 | 1284.8 | 1294.2 | 1295.8 |
| 20°   | 1353.9 | 1346.0 | 1336.6 | 1320.9 | 1297.4 | 1273.8 | 1265.9 | 1265.9 | 1272.2 | 1286.4 | 1286.4 |
| 22.5° | 1391.6 | 1382.2 | 1366.5 | 1330.3 | 1291.1 | 1258.1 | 1250.2 | 1255.0 | 1262.8 | 1281.7 | 1280.1 |
| 25°   | 1434.0 | 1421.4 | 1394.7 | 1327.2 | 1270.7 | 1231.4 | 1233.0 | 1247.1 | 1261.2 | 1281.7 | 1281.7 |
| 27.5° | 1481.1 | 1463.8 | 1410.4 | 1302.1 | 1225.1 | 1187.4 | 1201.5 | 1234.5 | 1255.0 | 1276.9 | 1280.1 |
| 30°   | 1533.0 | 1517.2 | 1423.0 | 1258.1 | 1151.3 | 1116.7 | 1151.3 | 1204.7 | 1236.1 | 1256.5 | 1261.2 |
| 32.5° | 1595.8 | 1583.2 | 1434.0 | 1201.5 | 1055.5 | 1025.6 | 1075.9 | 1141.9 | 1192.1 | 1215.7 | 1220.4 |
| 35°   | 1674.3 | 1661.7 | 1448.1 | 1137.2 | 966.0  | 934.5  | 980.1  | 1047.6 | 1113.6 | 1143.4 | 1152.9 |
| 37.5° | 1776.4 | 1757.6 | 1460.7 | 1068.0 | 890.6  | 854.4  | 876.4  | 937.7  | 997.4  | 1038.2 | 1049.2 |
| 40°   | 1906.8 | 1876.9 | 1471.7 | 989.5  | 824.6  | 783.8  | 791.6  | 821.5  | 856.0  | 892.1  | 906.3  |
| 42.5° | 2090.5 | 2030.9 | 1473.3 | 906.3  | 757.1  | 719.4  | 716.2  | 725.6  | 725.6  | 725.6  | 730.4  |
| 45°   | 2346.6 | 2233.5 | 1476.4 | 827.7  | 687.9  | 648.7  | 639.3  | 636.1  | 612.6  | 567.0  | 563.9  |
| 47.5° | 2670.1 | 2498.9 | 1490.5 | 761.8  | 615.7  | 581.1  | 568.6  | 556.0  | 512.0  | 464.9  | 455.5  |
| 50°   | 3084.8 | 2806.8 | 1518.8 | 698.9  | 554.4  | 530.9  | 515.2  | 485.3  | 436.6  | 400.5  | 391.1  |
| 52.5° | 3562.2 | 3172.7 | 1545.5 | 633.0  | 508.9  | 493.2  | 474.3  | 438.2  | 386.4  | 364.4  | 361.2  |
| 55°   | 4110.4 | 3581.1 | 1598.9 | 574.9  | 469.6  | 458.6  | 441.4  | 406.8  | 367.5  | 351.8  | 350.3  |
| 57.5° | 4671.1 | 4038.1 | 1674.3 | 523.0  | 431.9  | 425.6  | 425.6  | 395.8  | 370.7  | 364.4  | 364.4  |
| 60°   | 5211.4 | 4430.8 | 1616.2 | 474.3  | 397.4  | 400.5  | 430.4  | 422.5  | 403.7  | 411.5  | 416.2  |
| 62.5° | 5630.8 | 4661.7 | 1311.5 | 435.1  | 372.2  | 400.5  | 477.5  | 477.5  | 455.5  | 452.3  | 452.3  |
| 65°   | 5809.8 | 4658.6 | 922.0  | 405.2  | 362.8  | 439.8  | 532.5  | 507.3  | 449.2  | 427.2  | 422.5  |
| 67.5° | 5764.3 | 4454.4 | 636.1  | 384.8  | 359.7  | 480.6  | 557.6  | 486.9  | 420.9  | 402.1  | 388.0  |
| 70°   | 5363.8 | 4022.4 | 490.0  | 366.0  | 355.0  | 463.3  | 549.7  | 463.3  | 398.9  | 381.7  | 369.1  |
| 72.5° | 4327.1 | 3226.1 | 406.8  | 347.1  | 336.1  | 428.8  | 523.0  | 441.4  | 381.7  | 362.8  | 350.3  |
| 75°   | 2759.6 | 2029.3 | 344.0  | 322.0  | 300.0  | 384.8  | 486.9  | 419.4  | 362.8  | 337.7  | 328.3  |
| 77.5° | 1327.2 | 874.9  | 300.0  | 292.1  | 270.2  | 356.5  | 450.8  | 391.1  | 337.7  | 317.3  | 311.0  |
| 80°   | 537.2  | 400.5  | 260.7  | 262.3  | 248.2  | 339.3  | 425.6  | 364.4  | 312.6  | 290.6  | 279.6  |
| 82.5° | 279.6  | 232.5  | 219.9  | 226.2  | 226.2  | 323.6  | 406.8  | 342.4  | 290.6  | 281.1  | 245.0  |
| 85°   | 150.8  | 144.5  | 169.6  | 182.2  | 196.3  | 292.1  | 378.5  | 318.8  | 265.4  | 227.7  | 219.9  |
| 87.5° | 73.8   | 94.2   | 95.8   | 109.9  | 136.6  | 234.0  | 318.8  | 267.0  | 221.5  | 183.8  | 180.6  |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |



Report Prepared for

Cooper Lighting Solutions

(formerly Eaton)

STREETWORKS

Report Number: SP1-2101-121-8

Luminaire Tested: IFLD-S-SA2E-750-U-T2

Test Date: 03/05/2021

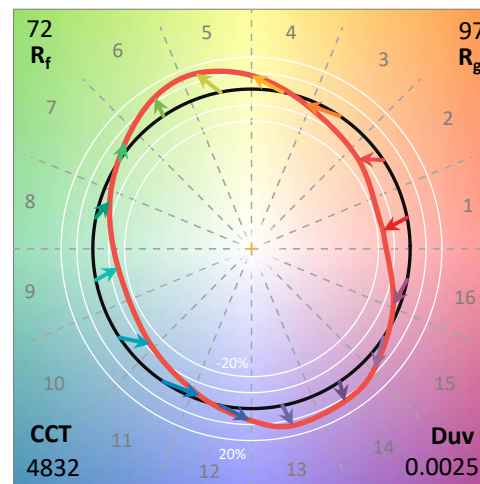
### Test Information

Test Method: LM-79-08  
 Report Number: SP1-2101-121-8  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1  
 Measurement Geometry:  $4\pi$   
 Issue Date: 03/05/2021  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: STREETWORKS  
 Catalog Number: **IFLD-S-SA2E-750-U-T2**  
 Description: STREETWORKS INF FLOOD

PROGRAMMED @ 615mA.

### Spectral Parameters

|                           |        |           |      |      |       |
|---------------------------|--------|-----------|------|------|-------|
| CCT (K):                  | 4832   | CRI (Ra): | 71.7 |      |       |
| CIE u':                   | 0.2115 | R1:       | 69.5 | R9:  | -27.7 |
| CIE v':                   | 0.4900 | R2:       | 75.7 | R10: | 42.9  |
| Duv:                      | 0.0025 | R3:       | 80.8 | R11: | 71.2  |
| CIE x:                    | 0.3506 | R4:       | 73.2 | R12: | 44.6  |
| CIE y:                    | 0.3611 | R5:       | 70.3 | R13: | 69.8  |
| CIE z:                    | 0.2884 | R6:       | 67.3 | R14: | 89.2  |
| Peak Wavelength (nm):     | 444    | R7:       | 79.9 |      |       |
| Dominant Wavelength (nm): | 572    | R8:       | 57.2 |      |       |
| Purity:                   | 13.7   |           |      |      |       |
| Rf:                       | 72.3   |           |      |      |       |
| Rg:                       | 96.7   |           |      |      |       |



### Test Conditions

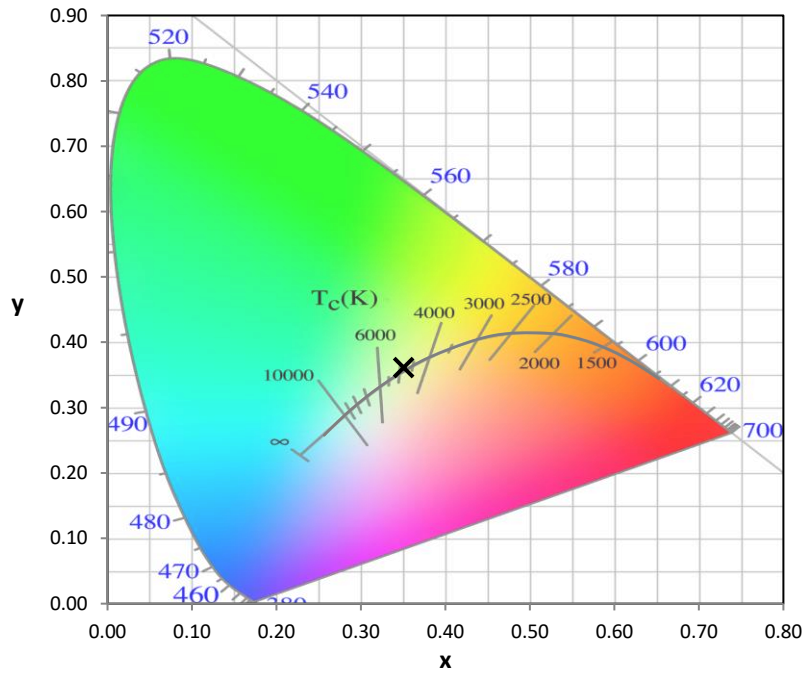
Stabilization Time: 47M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 24.9/31%  
 Sphere Temperature (°C): 24.4

REPORT NUMBER: SP1-2101-121-8

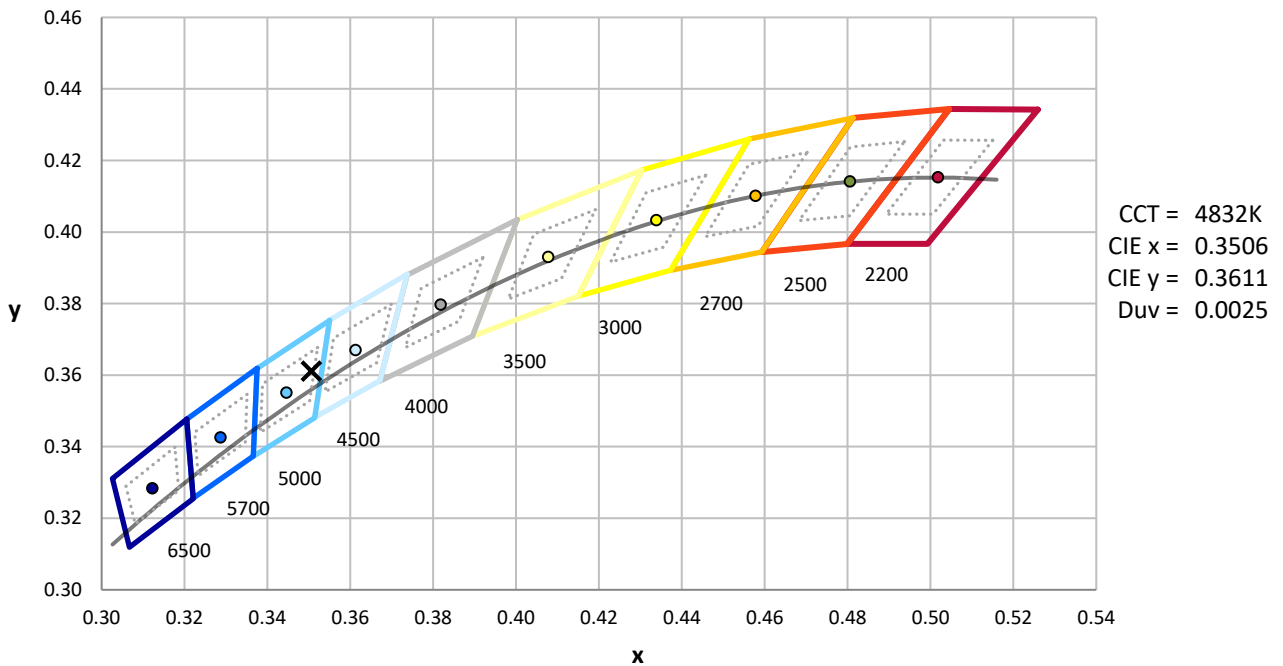
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| 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            |

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**CIE 1931 Chromaticity Diagram**



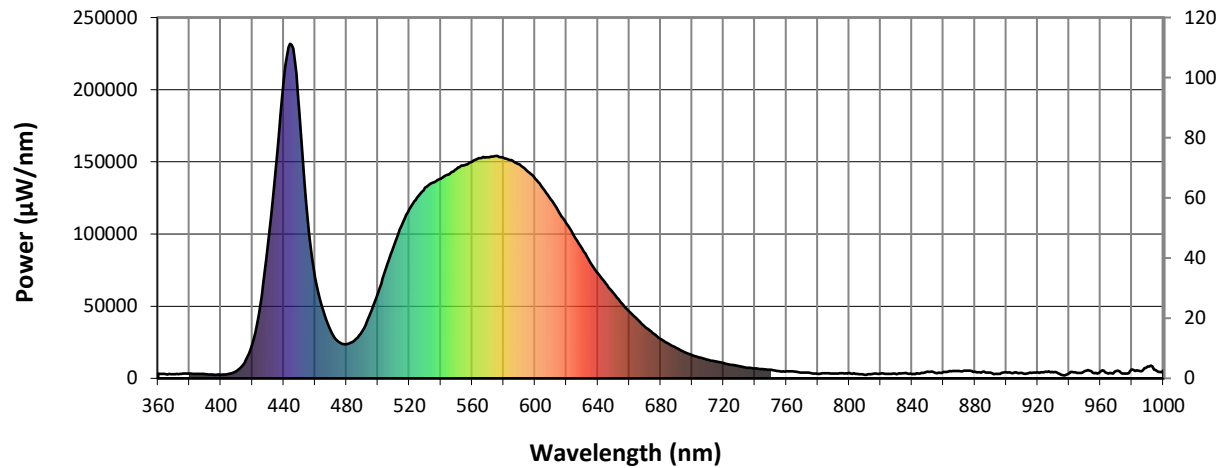
**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 5000K 4-step quadrangle

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### Photopic Flux vs. Wavelength

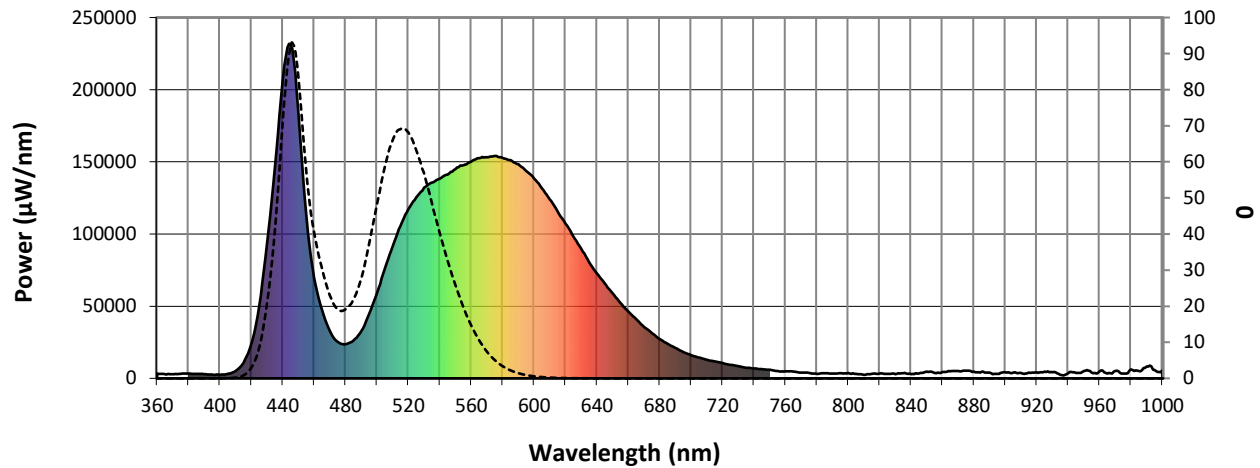


#####

| 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       | 3353             | 0.0              | 490       | 32805            | 4.7              | 620       | 107081           | 27.9             | 750       | 5910             | 0.0              | 880       | 4619             | 0.0              |
| 365       | 2862             | 0.0              | 495       | 44523            | 8.1              | 625       | 98536            | 21.7             | 755       | 5030             | 0.0              | 885       | 4614             | 0.0              |
| 370       | 2810             | 0.0              | 500       | 59272            | 13.1             | 630       | 89745            | 16.2             | 760       | 4853             | 0.0              | 890       | 3959             | 0.0              |
| 375       | 3214             | 0.0              | 505       | 75789            | 21.2             | 635       | 80639            | 12.1             | 765       | 4704             | 0.0              | 895       | 3106             | 0.0              |
| 380       | 3349             | 0.0              | 510       | 91523            | 31.4             | 640       | 72702            | 8.7              | 770       | 3920             | 0.0              | 900       | 4270             | 0.0              |
| 385       | 3025             | 0.0              | 515       | 105611           | 43.7             | 645       | 65679            | 6.3              | 775       | 3859             | 0.0              | 905       | 3918             | 0.0              |
| 390       | 2882             | 0.0              | 520       | 117273           | 56.9             | 650       | 59001            | 4.3              | 780       | 3115             | 0.0              | 910       | 3872             | 0.0              |
| 395       | 2575             | 0.0              | 525       | 125211           | 67.2             | 655       | 52143            | 3.0              | 785       | 3474             | 0.0              | 915       | 3970             | 0.0              |
| 400       | 2553             | 0.0              | 530       | 132145           | 77.8             | 660       | 46377            | 1.9              | 790       | 3401             | 0.0              | 920       | 4123             | 0.0              |
| 405       | 3040             | 0.0              | 535       | 135784           | 84.2             | 665       | 41029            | 1.3              | 795       | 3536             | 0.0              | 925       | 4692             | 0.0              |
| 410       | 5218             | 0.0              | 540       | 138313           | 90.1             | 670       | 35613            | 0.8              | 800       | 3687             | 0.0              | 930       | 4313             | 0.0              |
| 415       | 10898            | 0.0              | 545       | 141311           | 94.1             | 675       | 31345            | 0.5              | 805       | 3213             | 0.0              | 935       | 2374             | 0.0              |
| 420       | 23692            | 0.1              | 550       | 144916           | 98.5             | 680       | 27204            | 0.3              | 810       | 2541             | 0.0              | 940       | 3564             | 0.0              |
| 425       | 50574            | 0.3              | 555       | 147753           | 100.9            | 685       | 23938            | 0.2              | 815       | 3033             | 0.0              | 945       | 3888             | 0.0              |
| 430       | 93101            | 0.7              | 560       | 150201           | 102.1            | 690       | 21157            | 0.1              | 820       | 3270             | 0.0              | 950       | 5143             | 0.0              |
| 435       | 146856           | 1.7              | 565       | 152596           | 101.5            | 695       | 18244            | 0.1              | 825       | 3208             | 0.0              | 955       | 3966             | 0.0              |
| 440       | 206284           | 3.2              | 570       | 153241           | 99.6             | 700       | 16063            | 0.0              | 830       | 2991             | 0.0              | 960       | 4927             | 0.0              |
| 445       | 230963           | 4.8              | 575       | 154079           | 95.9             | 705       | 14433            | 0.0              | 835       | 3477             | 0.0              | 965       | 3279             | 0.0              |
| 450       | 184279           | 4.8              | 580       | 152658           | 90.7             | 710       | 12921            | 0.0              | 840       | 2982             | 0.0              | 970       | 5201             | 0.0              |
| 455       | 112612           | 3.8              | 585       | 151127           | 84.0             | 715       | 11715            | 0.0              | 845       | 3443             | 0.0              | 975       | 3421             | 0.0              |
| 460       | 69904            | 2.9              | 590       | 148249           | 76.6             | 720       | 10565            | 0.0              | 850       | 4753             | 0.0              | 980       | 6148             | 0.0              |
| 465       | 47480            | 2.4              | 595       | 143567           | 68.1             | 725       | 9312             | 0.0              | 855       | 3744             | 0.0              | 985       | 5069             | 0.0              |
| 470       | 32573            | 2.0              | 600       | 138422           | 59.7             | 730       | 8354             | 0.0              | 860       | 4355             | 0.0              | 990       | 8231             | 0.0              |
| 475       | 25178            | 2.0              | 605       | 131783           | 51.0             | 735       | 7425             | 0.0              | 865       | 4984             | 0.0              | 995       | 5852             | 0.0              |
| 480       | 23726            | 2.3              | 610       | 124021           | 42.6             | 740       | 6965             | 0.0              | 870       | 5065             | 0.0              | 1000      | 5471             | 0.0              |
| 485       | 26206            | 3.1              | 615       | 115646           | 34.9             | 745       | 6343             | 0.0              | 875       | 5430             | 0.0              |           |                  |                  |

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### Scotopic Flux vs. Wavelength



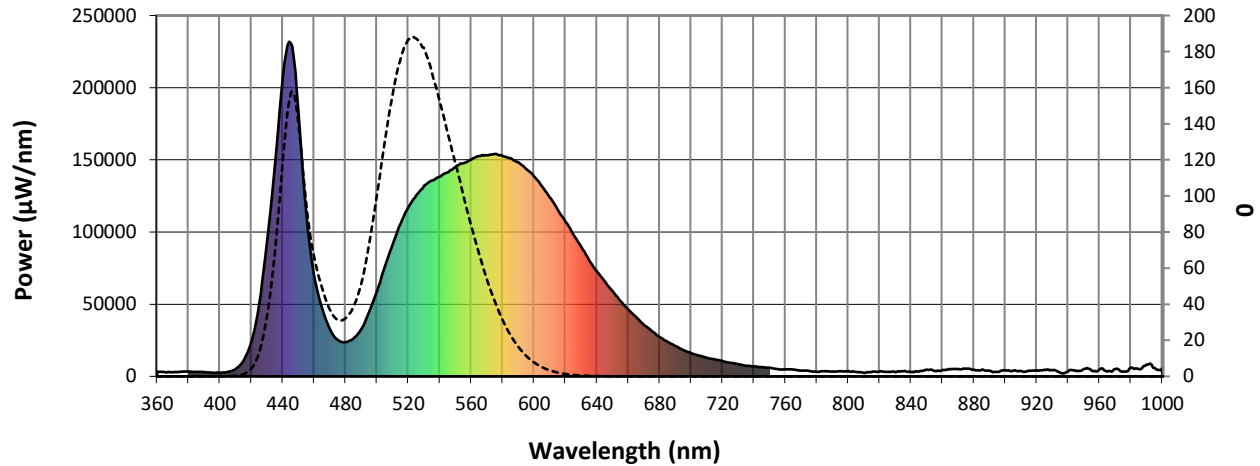
Scotopic Lumens: 15745.7

S/P: 1.71

| 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       | 3353             | 0.0              | 490       | 32805            | 50.5             | 620       | 107081           | 1.3              | 750       | 5910             | 0.0              | 880       | 4619             | 0.0              |
| 365       | 2862             | 0.0              | 495       | 44523            | 72.0             | 625       | 98536            | 0.8              | 755       | 5030             | 0.0              | 885       | 4614             | 0.0              |
| 370       | 2810             | 0.0              | 500       | 59272            | 99.1             | 630       | 89745            | 0.5              | 760       | 4853             | 0.0              | 890       | 3959             | 0.0              |
| 375       | 3214             | 0.0              | 505       | 75789            | 128.8            | 635       | 80639            | 0.3              | 765       | 4704             | 0.0              | 895       | 3106             | 0.0              |
| 380       | 3349             | 0.0              | 510       | 91523            | 155.1            | 640       | 72702            | 0.2              | 770       | 3920             | 0.0              | 900       | 4270             | 0.0              |
| 385       | 3025             | 0.0              | 515       | 105611           | 175.1            | 645       | 65679            | 0.1              | 775       | 3859             | 0.0              | 905       | 3918             | 0.0              |
| 390       | 2882             | 0.0              | 520       | 117273           | 186.4            | 650       | 59001            | 0.1              | 780       | 3115             | 0.0              | 910       | 3872             | 0.0              |
| 395       | 2575             | 0.0              | 525       | 125211           | 187.3            | 655       | 52143            | 0.0              | 785       | 3474             | 0.0              | 915       | 3970             | 0.0              |
| 400       | 2553             | 0.0              | 530       | 132145           | 182.2            | 660       | 46377            | 0.0              | 790       | 3401             | 0.0              | 920       | 4123             | 0.0              |
| 405       | 3040             | 0.1              | 535       | 135784           | 169.2            | 665       | 41029            | 0.0              | 795       | 3536             | 0.0              | 925       | 4692             | 0.0              |
| 410       | 5218             | 0.3              | 540       | 138313           | 152.8            | 670       | 35613            | 0.0              | 800       | 3687             | 0.0              | 930       | 4313             | 0.0              |
| 415       | 10898            | 1.1              | 545       | 141311           | 135.5            | 675       | 31345            | 0.0              | 805       | 3213             | 0.0              | 935       | 2374             | 0.0              |
| 420       | 23692            | 3.9              | 550       | 144916           | 118.5            | 680       | 27204            | 0.0              | 810       | 2541             | 0.0              | 940       | 3564             | 0.0              |
| 425       | 50574            | 12.4             | 555       | 147753           | 101.0            | 685       | 23938            | 0.0              | 815       | 3033             | 0.0              | 945       | 3888             | 0.0              |
| 430       | 93101            | 31.7             | 560       | 150201           | 84.0             | 690       | 21157            | 0.0              | 820       | 3270             | 0.0              | 950       | 5143             | 0.0              |
| 435       | 146856           | 65.7             | 565       | 152596           | 68.5             | 695       | 18244            | 0.0              | 825       | 3208             | 0.0              | 955       | 3966             | 0.0              |
| 440       | 206284           | 115.3            | 570       | 153241           | 54.1             | 700       | 16063            | 0.0              | 830       | 2991             | 0.0              | 960       | 4927             | 0.0              |
| 445       | 230963           | 154.7            | 575       | 154079           | 42.0             | 705       | 14433            | 0.0              | 835       | 3477             | 0.0              | 965       | 3279             | 0.0              |
| 450       | 184279           | 142.8            | 580       | 152658           | 31.5             | 710       | 12921            | 0.0              | 840       | 2982             | 0.0              | 970       | 5201             | 0.0              |
| 455       | 112612           | 98.4             | 585       | 151127           | 23.1             | 715       | 11715            | 0.0              | 845       | 3443             | 0.0              | 975       | 3421             | 0.0              |
| 460       | 69904            | 67.5             | 590       | 148249           | 16.5             | 720       | 10565            | 0.0              | 850       | 4753             | 0.0              | 980       | 6148             | 0.0              |
| 465       | 47480            | 50.1             | 595       | 143567           | 11.4             | 725       | 9312             | 0.0              | 855       | 3744             | 0.0              | 985       | 5069             | 0.0              |
| 470       | 32573            | 37.5             | 600       | 138422           | 7.8              | 730       | 8354             | 0.0              | 860       | 4355             | 0.0              | 990       | 8231             | 0.0              |
| 475       | 25178            | 31.5             | 605       | 131783           | 5.2              | 735       | 7425             | 0.0              | 865       | 4984             | 0.0              | 995       | 5852             | 0.0              |
| 480       | 23726            | 32.0             | 610       | 124021           | 3.4              | 740       | 6965             | 0.0              | 870       | 5065             | 0.0              | 1000      | 5471             | 0.0              |
| 485       | 26206            | 38.0             | 615       | 115646           | 2.1              | 745       | 6343             | 0.0              | 875       | 5430             | 0.0              |           |                  |                  |

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### Melanopic Flux vs. Wavelength



**Melanopic Lumens: 6193.8**

**M/P: 0.67**

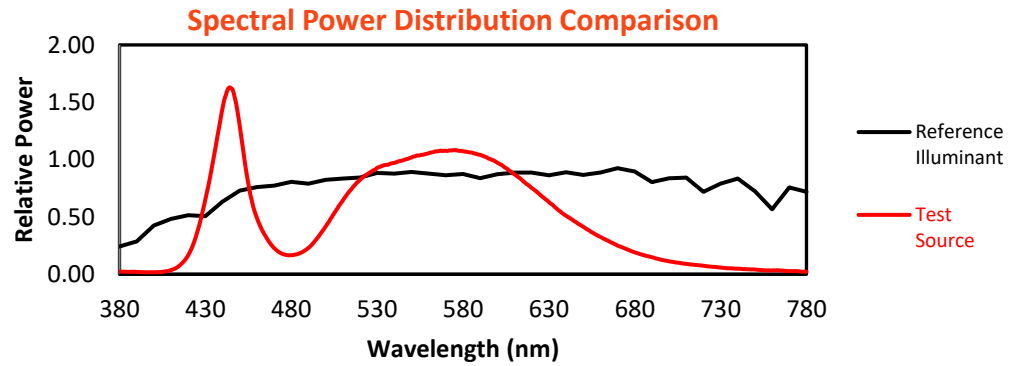
| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 3353             | 0.0              | 490       | 32805            | 27.3             | 620       | 107081           | 0.1              | 750       | 5910             | 0.0              | 880       | 4619             | 0.0              |
| 365       | 2862             | 0.0              | 495       | 44523            | 36.8             | 625       | 98536            | 0.1              | 755       | 5030             | 0.0              | 885       | 4614             | 0.0              |
| 370       | 2810             | 0.0              | 500       | 59272            | 47.6             | 630       | 89745            | 0.0              | 760       | 4853             | 0.0              | 890       | 3959             | 0.0              |
| 375       | 3214             | 0.0              | 505       | 75789            | 58.2             | 635       | 80639            | 0.0              | 765       | 4704             | 0.0              | 895       | 3106             | 0.0              |
| 380       | 3349             | 0.0              | 510       | 91523            | 65.7             | 640       | 72702            | 0.0              | 770       | 3920             | 0.0              | 900       | 4270             | 0.0              |
| 385       | 3025             | 0.0              | 515       | 105611           | 69.0             | 645       | 65679            | 0.0              | 775       | 3859             | 0.0              | 905       | 3918             | 0.0              |
| 390       | 2882             | 0.0              | 520       | 117273           | 68.3             | 650       | 59001            | 0.0              | 780       | 3115             | 0.0              | 910       | 3872             | 0.0              |
| 395       | 2575             | 0.0              | 525       | 125211           | 63.5             | 655       | 52143            | 0.0              | 785       | 3474             | 0.0              | 915       | 3970             | 0.0              |
| 400       | 2553             | 0.0              | 530       | 132145           | 57.1             | 660       | 46377            | 0.0              | 790       | 3401             | 0.0              | 920       | 4123             | 0.0              |
| 405       | 3040             | 0.1              | 535       | 135784           | 48.9             | 665       | 41029            | 0.0              | 795       | 3536             | 0.0              | 925       | 4692             | 0.0              |
| 410       | 5218             | 0.2              | 540       | 138313           | 40.5             | 670       | 35613            | 0.0              | 800       | 3687             | 0.0              | 930       | 4313             | 0.0              |
| 415       | 10898            | 0.7              | 545       | 141311           | 32.8             | 675       | 31345            | 0.0              | 805       | 3213             | 0.0              | 935       | 2374             | 0.0              |
| 420       | 23692            | 2.7              | 550       | 144916           | 26.0             | 680       | 27204            | 0.0              | 810       | 2541             | 0.0              | 940       | 3564             | 0.0              |
| 425       | 50574            | 7.9              | 555       | 147753           | 19.9             | 685       | 23938            | 0.0              | 815       | 3033             | 0.0              | 945       | 3888             | 0.0              |
| 430       | 93101            | 19.7             | 560       | 150201           | 14.8             | 690       | 21157            | 0.0              | 820       | 3270             | 0.0              | 950       | 5143             | 0.0              |
| 435       | 146856           | 39.2             | 565       | 152596           | 10.7             | 695       | 18244            | 0.0              | 825       | 3208             | 0.0              | 955       | 3966             | 0.0              |
| 440       | 206284           | 68.9             | 570       | 153241           | 7.5              | 700       | 16063            | 0.0              | 830       | 2991             | 0.0              | 960       | 4927             | 0.0              |
| 445       | 230963           | 91.1             | 575       | 154079           | 5.1              | 705       | 14433            | 0.0              | 835       | 3477             | 0.0              | 965       | 3279             | 0.0              |
| 450       | 184279           | 84.9             | 580       | 152658           | 3.4              | 710       | 12921            | 0.0              | 840       | 2982             | 0.0              | 970       | 5201             | 0.0              |
| 455       | 112612           | 59.0             | 585       | 151127           | 2.2              | 715       | 11715            | 0.0              | 845       | 3443             | 0.0              | 975       | 3421             | 0.0              |
| 460       | 69904            | 41.2             | 590       | 148249           | 1.5              | 720       | 10565            | 0.0              | 850       | 4753             | 0.0              | 980       | 6148             | 0.0              |
| 465       | 47480            | 31.0             | 595       | 143567           | 0.9              | 725       | 9312             | 0.0              | 855       | 3744             | 0.0              | 985       | 5069             | 0.0              |
| 470       | 32573            | 23.3             | 600       | 138422           | 0.6              | 730       | 8354             | 0.0              | 860       | 4355             | 0.0              | 990       | 8231             | 0.0              |
| 475       | 25178            | 19.2             | 605       | 131783           | 0.4              | 735       | 7425             | 0.0              | 865       | 4984             | 0.0              | 995       | 5852             | 0.0              |
| 480       | 23726            | 19.1             | 610       | 124021           | 0.2              | 740       | 6965             | 0.0              | 870       | 5065             | 0.0              | 1000      | 5471             | 0.0              |
| 485       | 26206            | 21.6             | 615       | 115646           | 0.1              | 745       | 6343             | 0.0              | 875       | 5430             | 0.0              |           |                  |                  |

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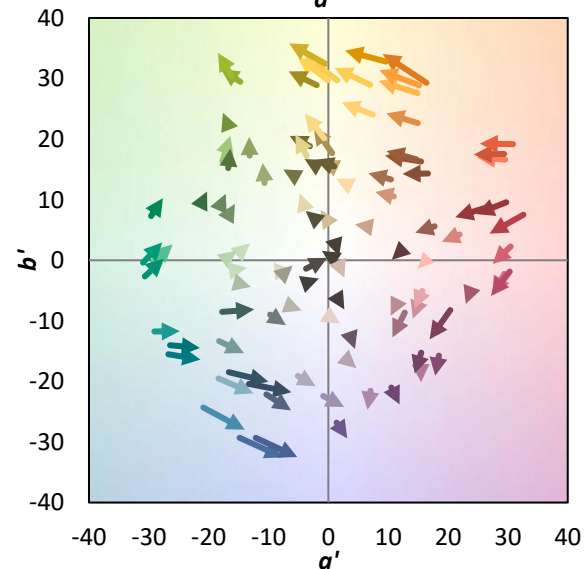
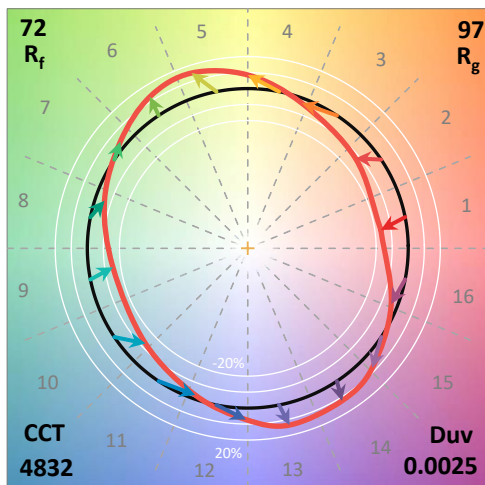
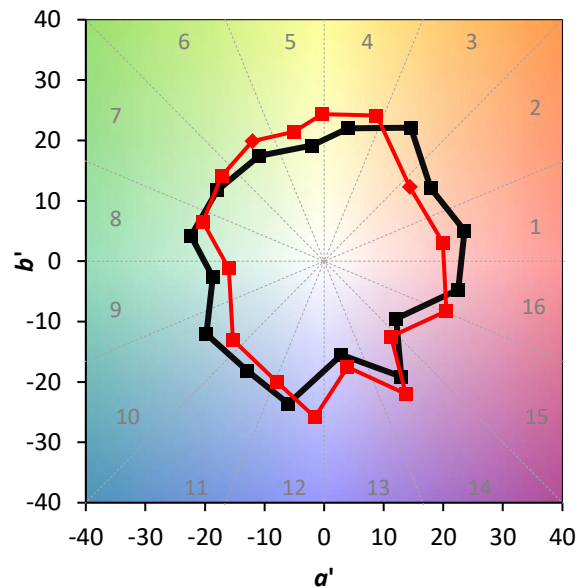
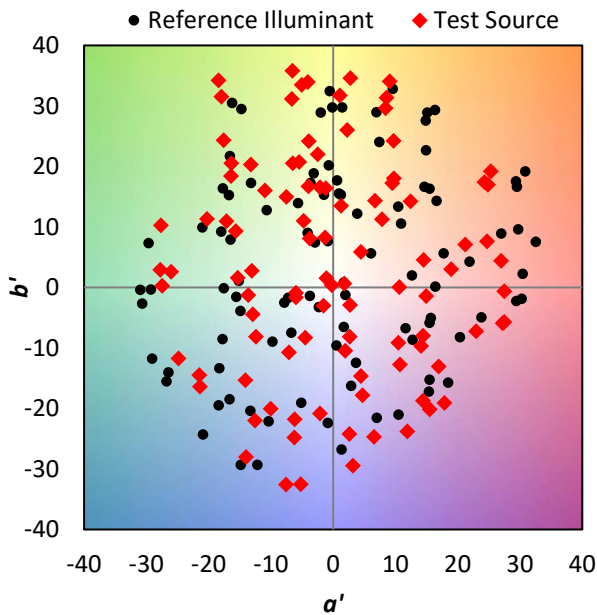
TM-30-18

### Summary

$R_f = 72.3$   
 $R_g = 96.7$   
 CIE  $R_a = 71.7$   
 $R_g = -27.7$



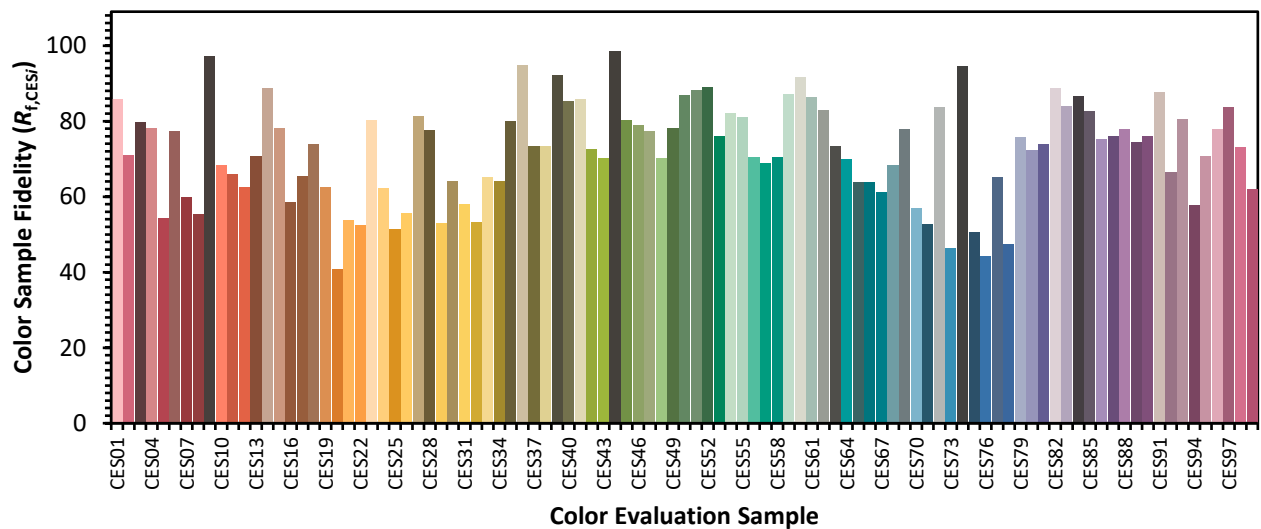
### Color Vector Graphics



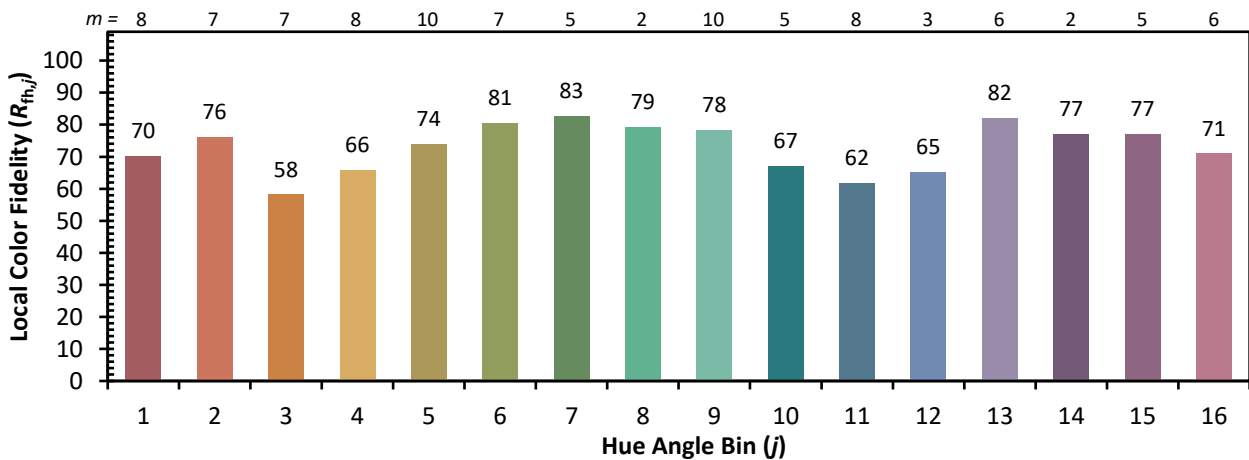
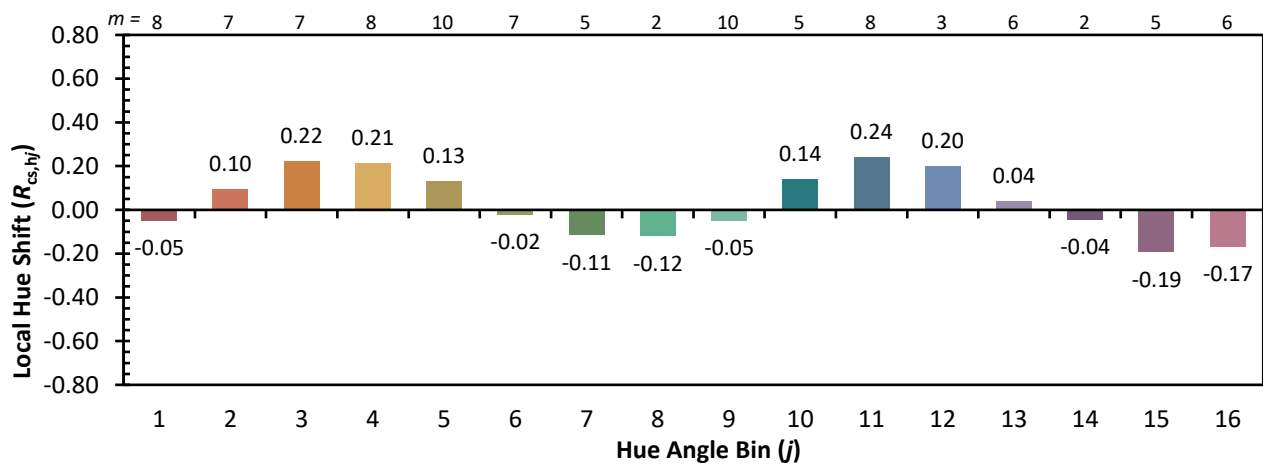
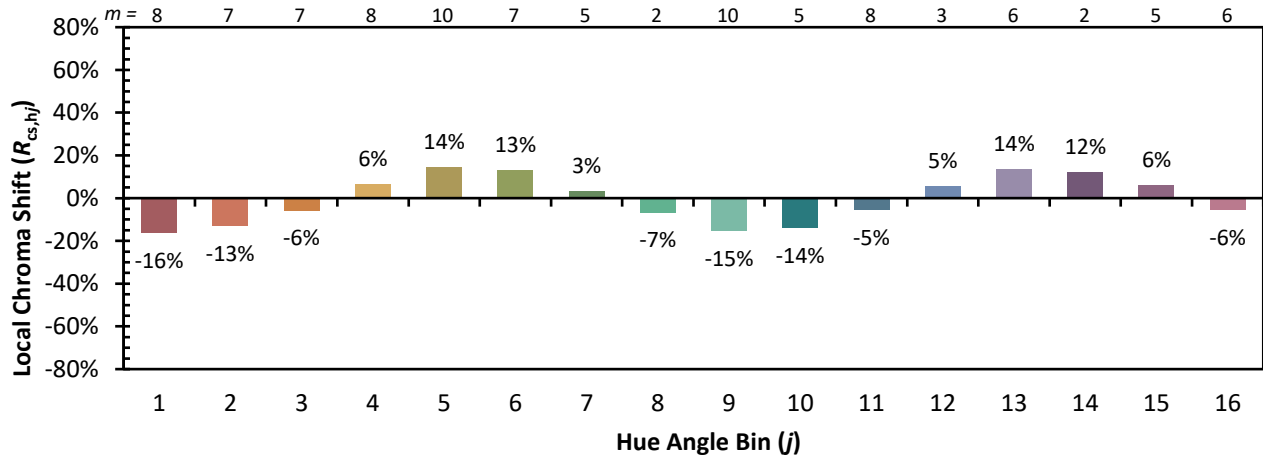


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 56 | CES51 = 88 | CES76 = 44 |
| CES02 = 60 | CES27 = 81 | CES52 = 89 | CES77 = 65 |
| CES03 = 30 | CES28 = 78 | CES53 = 76 | CES78 = 47 |
| CES04 = 69 | CES29 = 53 | CES54 = 82 | CES79 = 76 |
| CES05 = 46 | CES30 = 64 | CES55 = 81 | CES80 = 72 |
| CES06 = 50 | CES31 = 58 | CES56 = 70 | CES81 = 74 |
| CES07 = 39 | CES32 = 53 | CES57 = 69 | CES82 = 89 |
| CES08 = 38 | CES33 = 65 | CES58 = 70 | CES83 = 84 |
| CES09 = 29 | CES34 = 64 | CES59 = 87 | CES84 = 87 |
| CES10 = 73 | CES35 = 80 | CES60 = 92 | CES85 = 83 |
| CES11 = 56 | CES36 = 95 | CES61 = 86 | CES86 = 75 |
| CES12 = 62 | CES37 = 73 | CES62 = 83 | CES87 = 76 |
| CES13 = 42 | CES38 = 73 | CES63 = 73 | CES88 = 78 |
| CES14 = 74 | CES39 = 92 | CES64 = 70 | CES89 = 74 |
| CES15 = 70 | CES40 = 85 | CES65 = 64 | CES90 = 76 |
| CES16 = 46 | CES41 = 86 | CES66 = 64 | CES91 = 88 |
| CES17 = 49 | CES42 = 73 | CES67 = 61 | CES92 = 66 |
| CES18 = 55 | CES43 = 70 | CES68 = 68 | CES93 = 81 |
| CES19 = 71 | CES44 = 98 | CES69 = 78 | CES94 = 58 |
| CES20 = 64 | CES45 = 80 | CES70 = 57 | CES95 = 71 |
| CES21 = 85 | CES46 = 79 | CES71 = 53 | CES96 = 78 |
| CES22 = 77 | CES47 = 77 | CES72 = 84 | CES97 = 84 |
| CES23 = 91 | CES48 = 70 | CES73 = 46 | CES98 = 73 |
| CES24 = 90 | CES49 = 78 | CES74 = 95 | CES99 = 62 |
| CES25 = 71 | CES50 = 87 | CES75 = 50 |            |



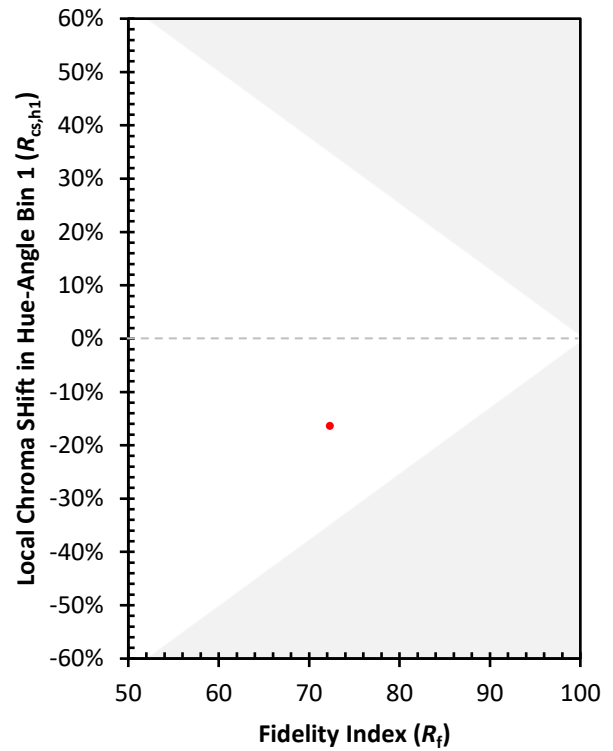
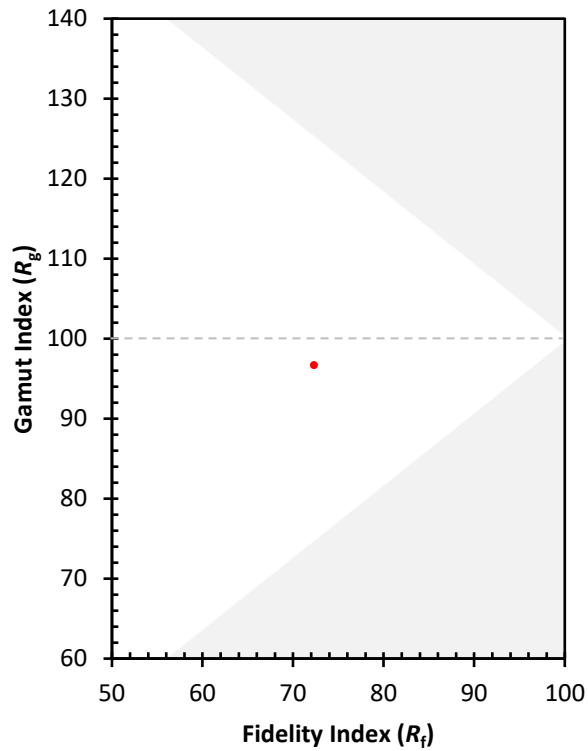
Color Rendition by Hue-Angle Bin



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**TM-30-18**

**Measure Comparisons**



(END OF REPORT)