

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: P800872

Luminaire Tested: **ARCH-M-PA2-100-750-24VDC-T2U**

Issue Date: 5/19/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P800872  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1910-568-12)  
Test Lab: INNOVATION CENTER  
Issue Date: 5/19/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: STREETWORKS  
Catalog Number: ARCH-M-PA2-100-750-24VDC-T2U  
Description: ARCHEON-M ROADWAY AND AREA LUMINAIRE  
(2) 70 CRI, 5000K, 660mA LIGHT ENGINES WITH 16 LEDS AND TYPE II U OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 15730 lumens  
Efficiency: N/A  
Efficacy: 160.5 lumens/watt  
Luminous Opening: Rectangular (W 0.75' x L: 1' x H: 0')  
IES Classification: Type II - Short  
BUG Rating: B3 - U0 - G3

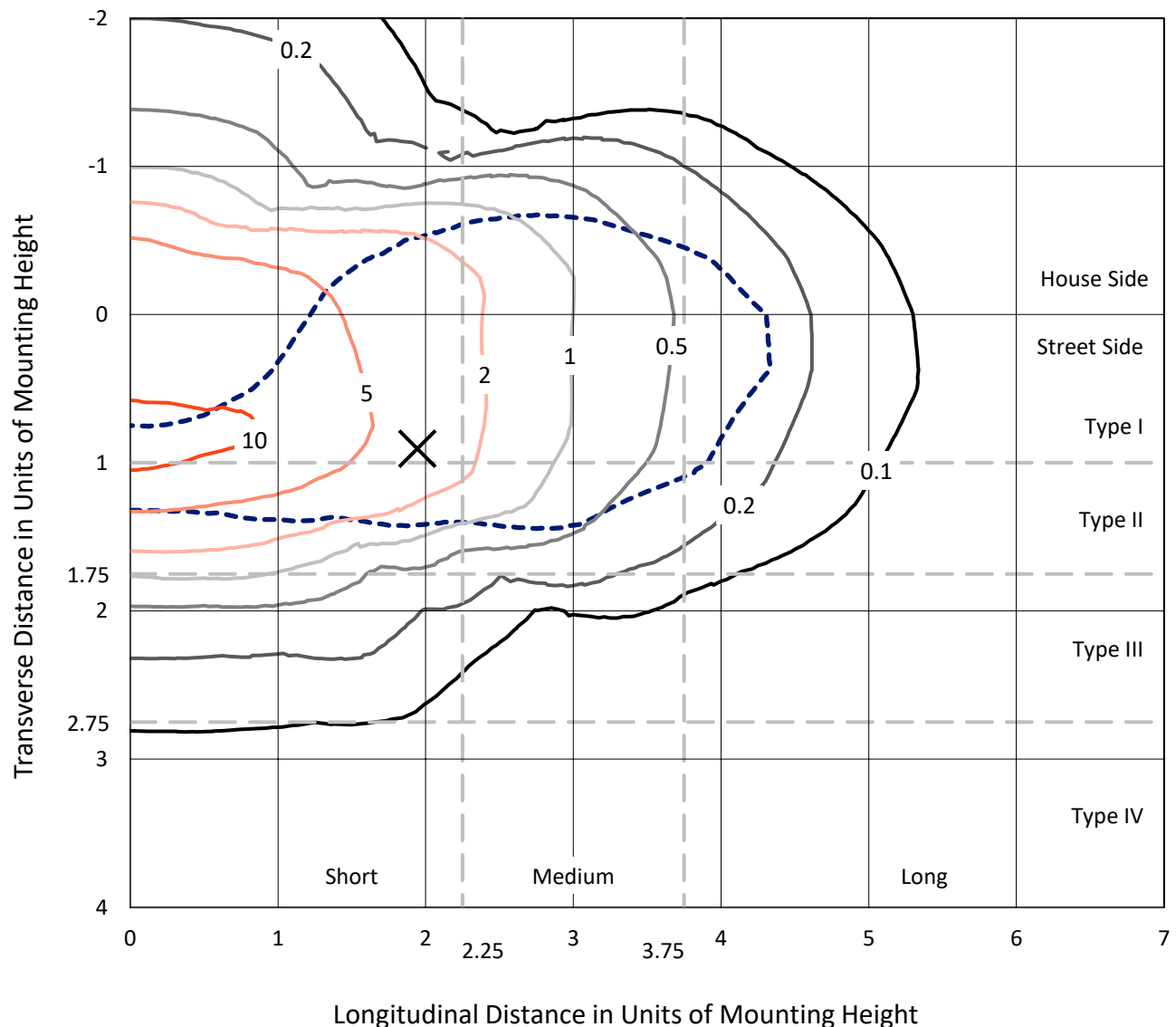
Input Watts (W): 98  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 25 FT

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## Iso-Footcandle Lines of Horizontal Illumination

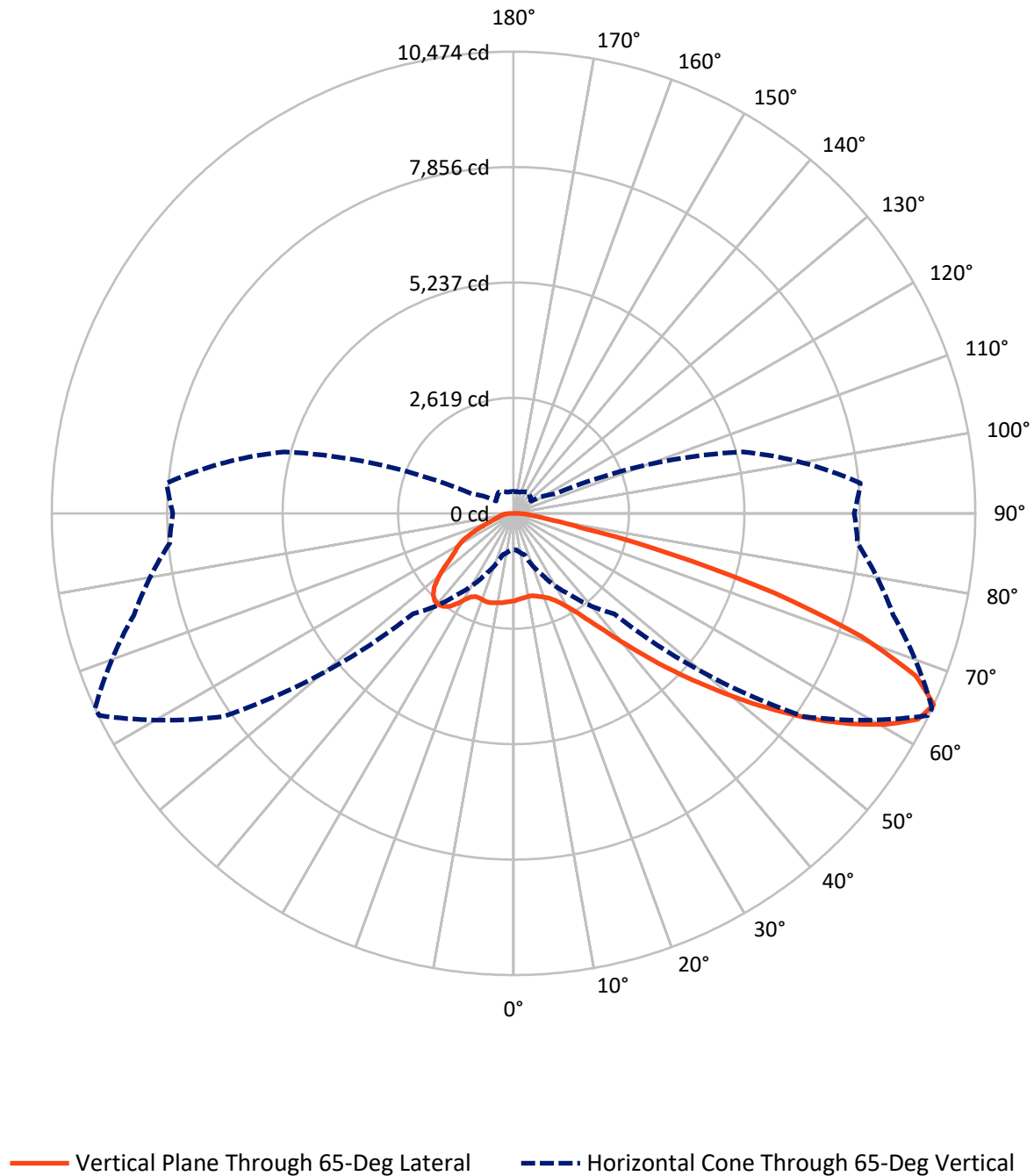
× Max cd  
 - - - 1/2 Max cd



Based on 15 foot mounting height. Maximum calculated value = 12 fc  
 Type II - Short - N/A

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## Luminous Intensity Polar Plot



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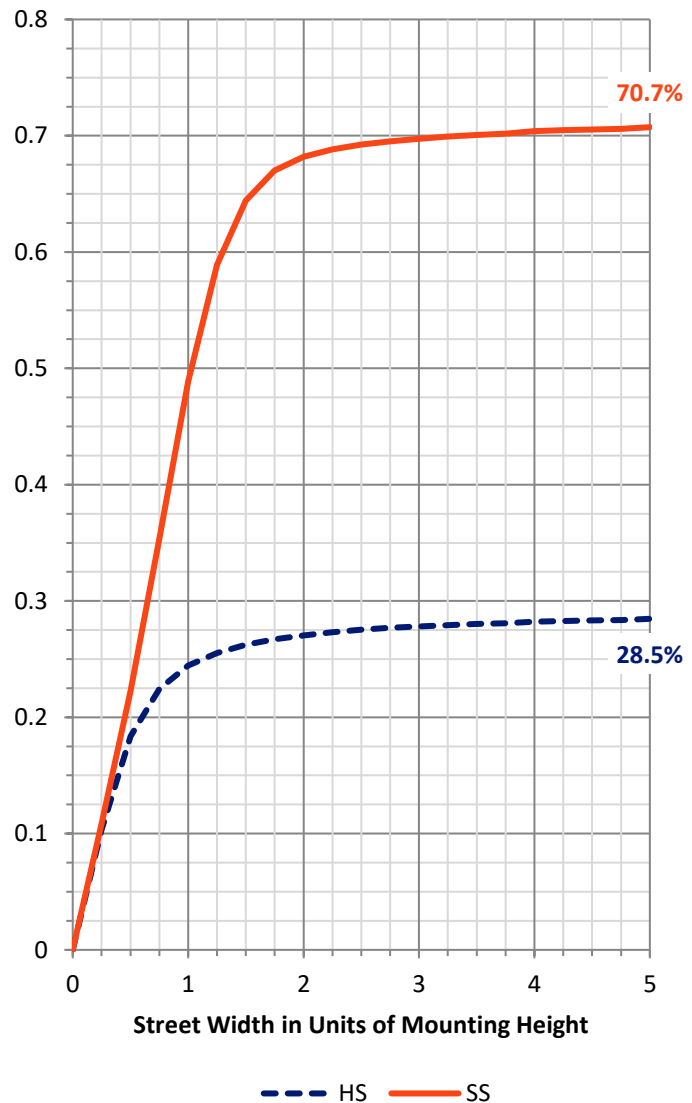
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 4547.8   | 0.0    | 4547.8  |
|                    | % Fixture | 28.9     | 0.0    | 28.9    |
| <b>Street Side</b> | Lumens    | 11182.2  | 0.0    | 11182.2 |
|                    | % Fixture | 71.1     | 0.0    | 71.1    |
| <b>Total</b>       | Lumens    | 15730.0  | 0.0    | 15730.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 189.4   | 1.2       |
| 10°-20°   | 565.4   | 3.6       |
| 20°-30°   | 1004.3  | 6.4       |
| 30°-40°   | 1699.0  | 10.8      |
| 40°-50°   | 2957.6  | 18.8      |
| 50°-60°   | 3822.1  | 24.3      |
| 60°-70°   | 3344.5  | 21.3      |
| 70°-80°   | 1819.2  | 11.6      |
| 80°-90°   | 328.7   | 2.1       |
| 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°    | 15730.0 | 100.0     |
| 0°-180°   | 15730.0 | 100.0     |

**Coefficient of Utilization**



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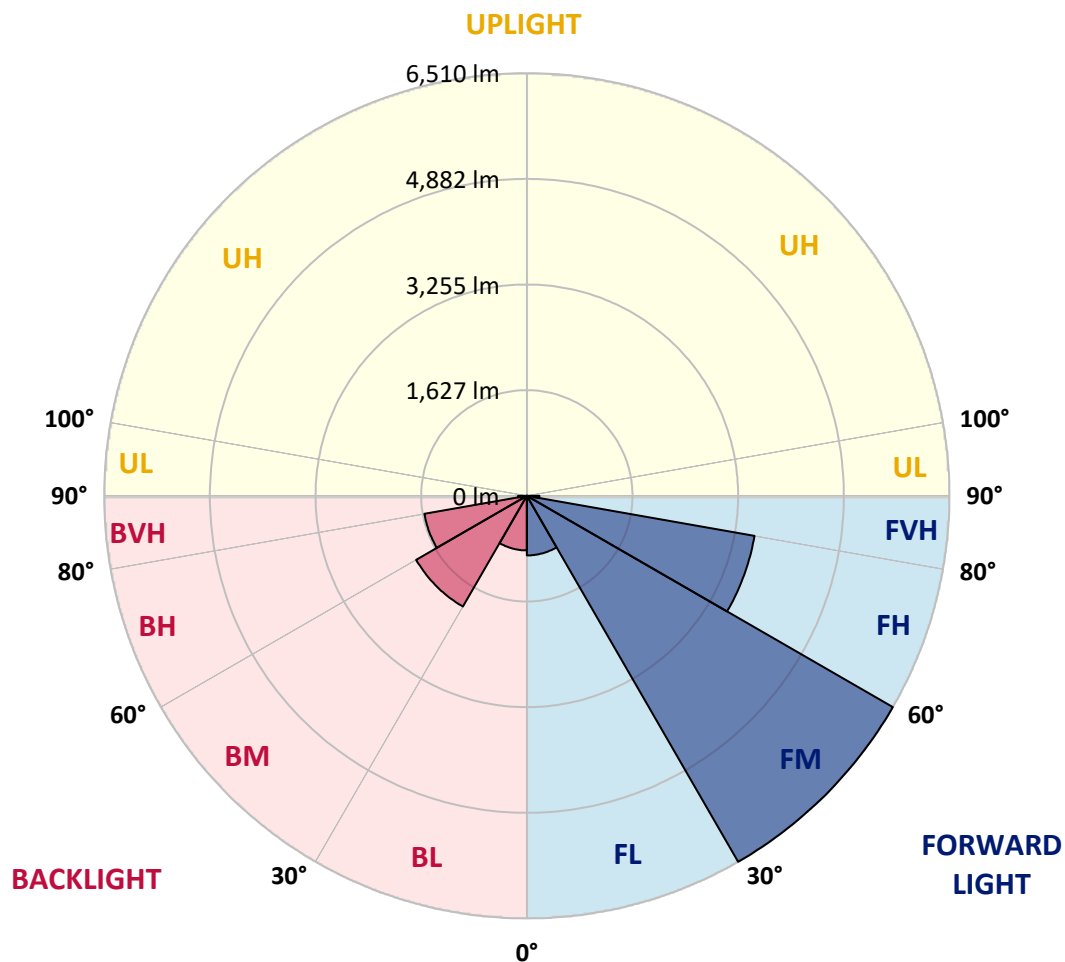
CATALOG NUMBER: ARCH-M-PA2-100-750-24VDC-T2U

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 917.8  | 5.8       |                         |      |         |
| FM   | (30°-60°)   | 6509.5 | 41.4      |                         |      |         |
| FH   | (60°-80°)   | 3561.5 | 22.6      |                         |      | G2/5000 |
| FVH  | (80°-90°)   | 193.4  | 1.2       |                         |      | G2/225  |
| BL   | (0°-30°)    | 841.2  | 5.3       | B2/1000                 |      |         |
| BM   | (30°-60°)   | 1969.1 | 12.5      | B2/2500                 |      |         |
| BH   | (60°-80°)   | 1602.2 | 10.2      | B3/2500                 |      | G3/2500 |
| BVH  | (80°-90°)   | 135.3  | 0.9       |                         |      | G2/225  |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B3-U0-G3**

Type II Short





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 64°     | 65°     | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|---------|---------|--------|--------|
| 0°    | 1987.6 | 1987.6 | 1987.6 | 1987.6 | 1987.6 | 1987.6 | 1987.6 | 1987.6  | 1987.6  | 1987.6 | 1987.6 |
| 2.5°  | 1952.4 | 1950.4 | 1946.2 | 1950.4 | 1952.4 | 1956.6 | 1954.5 | 1958.7  | 1956.6  | 1962.8 | 1973.1 |
| 5°    | 1902.7 | 1898.6 | 1896.5 | 1906.9 | 1913.1 | 1923.5 | 1927.6 | 1942.1  | 1940.0  | 1950.4 | 1966.9 |
| 7.5°  | 1846.8 | 1846.8 | 1844.8 | 1857.2 | 1865.5 | 1884.1 | 1898.6 | 1923.5  | 1925.5  | 1944.2 | 1962.8 |
| 10°   | 1803.4 | 1805.4 | 1803.4 | 1813.7 | 1826.1 | 1848.9 | 1873.8 | 1909.0  | 1911.0  | 1937.9 | 1956.6 |
| 12.5° | 1786.8 | 1786.8 | 1786.8 | 1801.3 | 1817.9 | 1848.9 | 1877.9 | 1915.2  | 1919.3  | 1948.3 | 1964.9 |
| 15°   | 1809.6 | 1811.6 | 1807.5 | 1822.0 | 1840.6 | 1877.9 | 1904.8 | 1944.2  | 1948.3  | 1975.2 | 1985.6 |
| 17.5° | 1890.3 | 1898.6 | 1888.3 | 1896.5 | 1892.4 | 1921.4 | 1946.2 | 1985.6  | 1987.6  | 2010.4 | 2014.6 |
| 20°   | 2049.8 | 2058.0 | 2041.5 | 2031.1 | 1993.8 | 1991.8 | 2002.1 | 2033.2  | 2033.2  | 2047.7 | 2037.3 |
| 22.5° | 2296.1 | 2304.4 | 2275.4 | 2236.1 | 2147.1 | 2103.6 | 2080.8 | 2095.3  | 2093.2  | 2099.4 | 2072.5 |
| 25°   | 2623.3 | 2621.2 | 2586.0 | 2513.5 | 2370.7 | 2265.1 | 2209.2 | 2186.4  | 2186.4  | 2174.0 | 2140.9 |
| 27.5° | 3029.1 | 2998.0 | 2935.9 | 2848.9 | 2650.2 | 2503.2 | 2383.1 | 2325.1  | 2314.8  | 2277.5 | 2215.4 |
| 30°   | 3461.8 | 3439.0 | 3350.0 | 3223.7 | 2993.9 | 2805.5 | 2606.7 | 2490.8  | 2484.5  | 2403.8 | 2310.6 |
| 32.5° | 3971.1 | 3933.9 | 3834.5 | 3683.3 | 3408.0 | 3143.0 | 2894.5 | 2718.5  | 2708.2  | 2579.8 | 2451.4 |
| 35°   | 4625.4 | 4594.3 | 4401.8 | 4250.6 | 3896.6 | 3548.8 | 3254.8 | 3020.8  | 3012.5  | 2855.2 | 2691.6 |
| 37.5° | 5410.1 | 5329.4 | 5143.0 | 4859.4 | 4486.7 | 4074.7 | 3702.0 | 3408.0  | 3397.6  | 3223.7 | 3016.7 |
| 40°   | 6109.9 | 6037.4 | 5871.8 | 5610.9 | 5211.3 | 4753.8 | 4248.6 | 3892.5  | 3882.1  | 3670.9 | 3410.0 |
| 42.5° | 6627.5 | 6577.8 | 6470.2 | 6319.0 | 6033.3 | 5755.9 | 4946.3 | 4478.4  | 4459.8  | 4186.5 | 3861.4 |
| 45°   | 6927.7 | 6888.4 | 6826.3 | 6863.6 | 6859.4 | 6807.7 | 5778.6 | 5176.1  | 5116.1  | 4762.0 | 4364.5 |
| 47.5° | 6855.3 | 6820.1 | 6844.9 | 7134.8 | 7534.4 | 7834.6 | 6747.6 | 5890.4  | 5809.7  | 5348.0 | 4900.8 |
| 50°   | 6331.5 | 6345.9 | 6476.4 | 7031.3 | 7927.8 | 8594.5 | 7822.2 | 6704.1  | 6596.5  | 5938.1 | 5410.1 |
| 52.5° | 5377.0 | 5412.2 | 5728.9 | 6505.4 | 7884.3 | 9087.2 | 8793.2 | 7544.7  | 7401.9  | 6513.7 | 5873.9 |
| 55°   | 4271.3 | 4360.4 | 4770.3 | 5586.1 | 7317.0 | 9122.4 | 9526.2 | 8389.5  | 8232.1  | 7054.0 | 6277.6 |
| 57.5° | 3159.5 | 3292.0 | 3766.2 | 4515.7 | 6230.0 | 8565.5 | 9892.6 | 9197.0  | 9006.5  | 7590.3 | 6704.1 |
| 60°   | 2004.2 | 2084.9 | 2631.5 | 3515.6 | 4768.3 | 7203.1 | 9845.0 | 9884.4  | 9718.7  | 8124.5 | 7149.3 |
| 62.5° | 1279.5 | 1318.9 | 1594.3 | 2507.3 | 3333.4 | 5333.5 | 9325.3 | 10404.0 | 10292.2 | 8611.0 | 7571.7 |
| 65°   | 822.0  | 838.5  | 979.3  | 1542.5 | 2269.2 | 3219.6 | 8031.3 | 10459.9 | 10474.4 | 8915.4 | 7832.5 |
| 67.5° | 668.8  | 677.0  | 728.8  | 952.4  | 1604.6 | 1778.5 | 5594.4 | 9664.9  | 9840.9  | 8836.7 | 7743.5 |
| 70°   | 608.7  | 619.1  | 672.9  | 759.9  | 1242.3 | 1227.8 | 2708.2 | 8087.2  | 8375.0  | 8383.3 | 7348.0 |
| 72.5° | 513.5  | 528.0  | 600.4  | 718.4  | 960.7  | 969.0  | 1147.0 | 5760.0  | 6184.4  | 7493.0 | 6753.8 |
| 75°   | 428.6  | 436.9  | 499.0  | 633.6  | 813.7  | 774.4  | 805.4  | 3053.9  | 3666.8  | 6008.5 | 6122.3 |
| 77.5° | 347.8  | 356.1  | 401.7  | 505.2  | 722.6  | 602.5  | 633.6  | 1265.0  | 1563.2  | 4078.8 | 5004.3 |
| 80°   | 248.5  | 256.7  | 308.5  | 393.4  | 546.6  | 542.5  | 470.0  | 697.7   | 757.8   | 2205.0 | 3250.6 |
| 82.5° | 178.1  | 184.3  | 234.0  | 281.6  | 378.9  | 544.5  | 354.0  | 474.1   | 496.9   | 977.3  | 1310.6 |
| 85°   | 120.1  | 120.1  | 161.5  | 186.3  | 244.3  | 343.7  | 285.7  | 320.9   | 335.4   | 463.8  | 354.0  |
| 87.5° | 51.8   | 51.8   | 87.0   | 95.2   | 128.4  | 159.4  | 213.3  | 161.5   | 165.6   | 250.5  | 144.9  |
| 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: P800872

CATALOG NUMBER: ARCH-M-PA2-100-750-24VDC-T2U

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1987.6 | 1987.6 | 1987.6 | 1987.6 | 1987.6 | 1987.6 | 1987.6 | 1987.6 | 1987.6 | 1987.6 | 1987.6 |
| 2.5°  | 1979.4 | 1981.4 | 1985.6 | 1998.0 | 2006.3 | 2018.7 | 2024.9 | 2033.2 | 2033.2 | 2029.0 | 2031.1 |
| 5°    | 1975.2 | 1981.4 | 1995.9 | 2018.7 | 2033.2 | 2056.0 | 2072.5 | 2084.9 | 2089.1 | 2084.9 | 2087.0 |
| 7.5°  | 1973.1 | 1983.5 | 2008.3 | 2041.5 | 2062.2 | 2091.2 | 2113.9 | 2128.4 | 2138.8 | 2134.6 | 2136.7 |
| 10°   | 1966.9 | 1983.5 | 2014.6 | 2056.0 | 2087.0 | 2116.0 | 2136.7 | 2142.9 | 2149.1 | 2145.0 | 2142.9 |
| 12.5° | 1975.2 | 1993.8 | 2027.0 | 2076.7 | 2111.9 | 2134.6 | 2140.9 | 2130.5 | 2116.0 | 2107.7 | 2105.7 |
| 15°   | 1991.8 | 2010.4 | 2043.5 | 2095.3 | 2126.4 | 2134.6 | 2120.1 | 2087.0 | 2053.9 | 2035.3 | 2033.2 |
| 17.5° | 2014.6 | 2027.0 | 2053.9 | 2099.4 | 2124.3 | 2113.9 | 2084.9 | 2045.6 | 2020.8 | 2006.3 | 2008.3 |
| 20°   | 2029.0 | 2029.0 | 2049.8 | 2084.9 | 2105.7 | 2097.4 | 2062.2 | 2018.7 | 1979.4 | 1960.7 | 1954.5 |
| 22.5° | 2049.8 | 2039.4 | 2041.5 | 2072.5 | 2101.5 | 2089.1 | 2014.6 | 1937.9 | 1882.0 | 1861.3 | 1859.3 |
| 25°   | 2105.7 | 2076.7 | 2058.0 | 2076.7 | 2145.0 | 2043.5 | 1894.5 | 1805.4 | 1753.7 | 1735.0 | 1737.1 |
| 27.5° | 2174.0 | 2134.6 | 2095.3 | 2126.4 | 2180.2 | 1940.0 | 1741.3 | 1639.8 | 1608.7 | 1594.3 | 1600.5 |
| 30°   | 2242.3 | 2190.5 | 2138.8 | 2250.6 | 2155.3 | 1778.5 | 1544.6 | 1445.2 | 1418.3 | 1407.9 | 1416.2 |
| 32.5° | 2368.6 | 2283.7 | 2221.6 | 2416.2 | 2078.7 | 1594.3 | 1331.3 | 1240.2 | 1215.4 | 1202.9 | 1198.8 |
| 35°   | 2579.8 | 2472.1 | 2410.0 | 2561.2 | 1971.1 | 1389.3 | 1136.7 | 1072.5 | 1045.6 | 1018.7 | 1014.5 |
| 37.5° | 2884.1 | 2753.7 | 2697.8 | 2644.0 | 1819.9 | 1186.4 | 987.6  | 944.1  | 904.8  | 863.4  | 861.3  |
| 40°   | 3248.5 | 3078.8 | 3037.4 | 2681.2 | 1610.8 | 995.9  | 884.1  | 842.7  | 793.0  | 753.6  | 755.7  |
| 42.5° | 3668.8 | 3451.4 | 3362.4 | 2670.9 | 1352.0 | 894.4  | 809.5  | 764.0  | 720.5  | 685.3  | 683.3  |
| 45°   | 4118.1 | 3871.8 | 3666.8 | 2598.4 | 1095.3 | 824.0  | 764.0  | 710.2  | 666.7  | 627.3  | 623.2  |
| 47.5° | 4615.0 | 4339.7 | 3948.4 | 2457.6 | 904.8  | 774.4  | 737.1  | 660.5  | 621.1  | 596.3  | 596.3  |
| 50°   | 5116.1 | 4786.9 | 4207.2 | 2244.4 | 793.0  | 737.1  | 697.7  | 633.6  | 602.5  | 581.8  | 581.8  |
| 52.5° | 5544.7 | 5252.7 | 4420.4 | 1989.7 | 722.6  | 706.0  | 670.8  | 621.1  | 588.0  | 569.4  | 567.3  |
| 55°   | 5960.8 | 5685.5 | 4610.9 | 1737.1 | 664.6  | 664.6  | 664.6  | 610.8  | 573.5  | 557.0  | 554.9  |
| 57.5° | 6374.9 | 6141.0 | 4809.7 | 1571.5 | 612.9  | 629.4  | 652.2  | 598.4  | 561.1  | 546.6  | 544.5  |
| 60°   | 6842.9 | 6687.6 | 5039.5 | 1455.5 | 567.3  | 592.2  | 635.6  | 583.9  | 540.4  | 528.0  | 525.9  |
| 62.5° | 7339.8 | 7339.8 | 5248.6 | 1292.0 | 525.9  | 561.1  | 610.8  | 565.2  | 521.8  | 511.4  | 509.3  |
| 65°   | 7729.0 | 7896.7 | 5383.2 | 1047.7 | 484.5  | 530.0  | 581.8  | 540.4  | 496.9  | 494.8  | 490.7  |
| 67.5° | 7774.6 | 8037.5 | 5298.3 | 790.9  | 447.2  | 496.9  | 552.8  | 513.5  | 472.1  | 472.1  | 465.9  |
| 70°   | 7447.4 | 7714.5 | 5033.3 | 592.2  | 420.3  | 463.8  | 515.5  | 480.3  | 441.0  | 445.1  | 434.8  |
| 72.5° | 6900.8 | 6967.1 | 4374.9 | 467.9  | 389.2  | 428.6  | 470.0  | 443.1  | 407.9  | 407.9  | 393.4  |
| 75°   | 6180.3 | 5811.8 | 3178.1 | 391.3  | 352.0  | 387.2  | 424.4  | 401.7  | 370.6  | 360.3  | 352.0  |
| 77.5° | 4919.4 | 4211.3 | 1846.8 | 337.5  | 320.9  | 347.8  | 372.7  | 356.1  | 329.2  | 306.4  | 306.4  |
| 80°   | 2998.0 | 2468.0 | 815.8  | 291.9  | 283.7  | 304.4  | 320.9  | 302.3  | 279.5  | 256.7  | 250.5  |
| 82.5° | 1140.8 | 952.4  | 395.5  | 250.5  | 248.5  | 260.9  | 273.3  | 254.7  | 238.1  | 227.8  | 196.7  |
| 85°   | 312.6  | 287.8  | 271.2  | 209.1  | 205.0  | 202.9  | 217.4  | 209.1  | 186.3  | 153.2  | 136.7  |
| 87.5° | 118.0  | 134.6  | 147.0  | 128.4  | 136.7  | 126.3  | 144.9  | 132.5  | 118.0  | 76.6   | 68.3   |
| 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

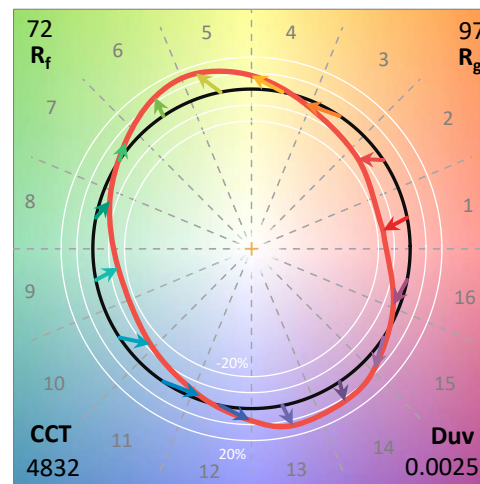
### Test Information

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

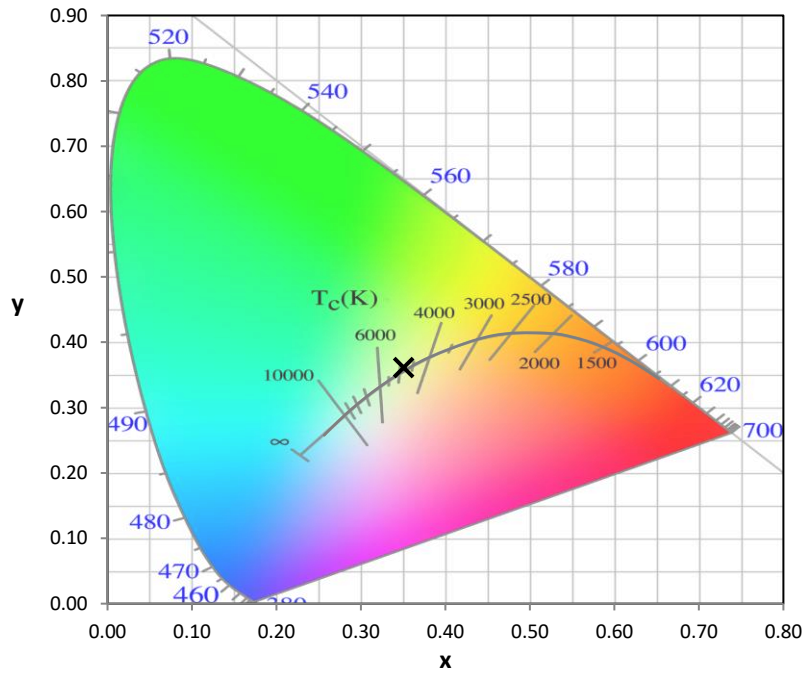
Stabilization Time: 47M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 24.9/31%  
 Sphere Temperature (°C): 24.4

REPORT NUMBER: SP1-2101-121-8

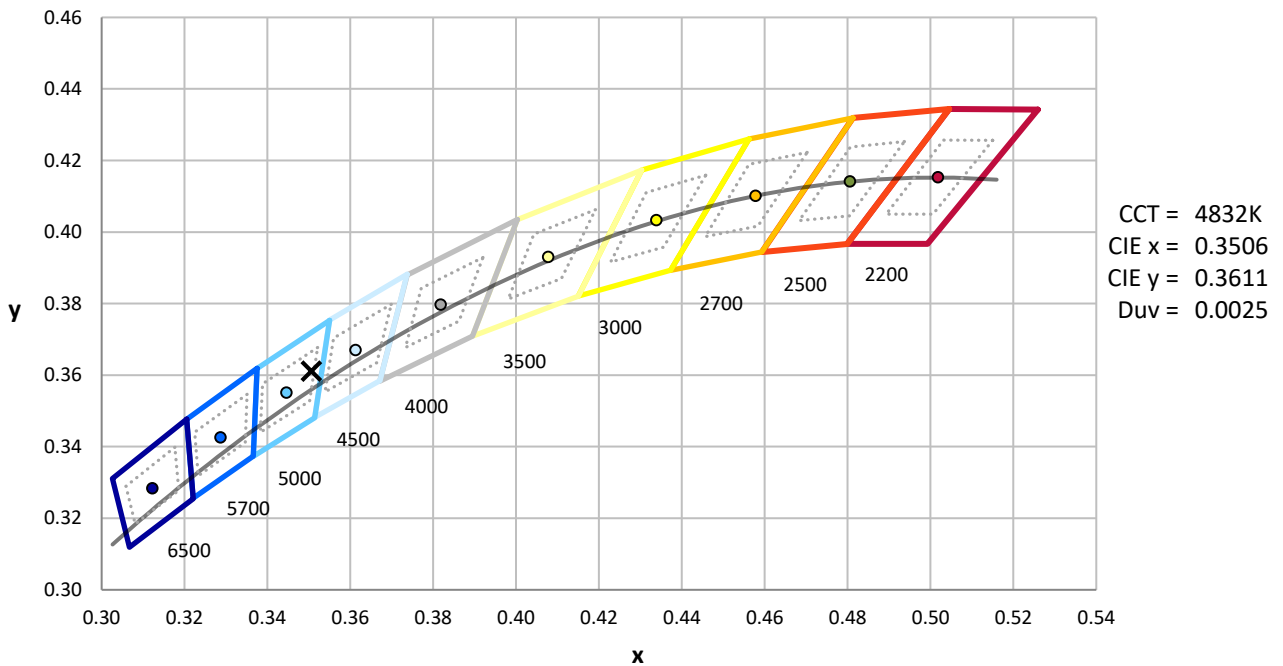
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date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



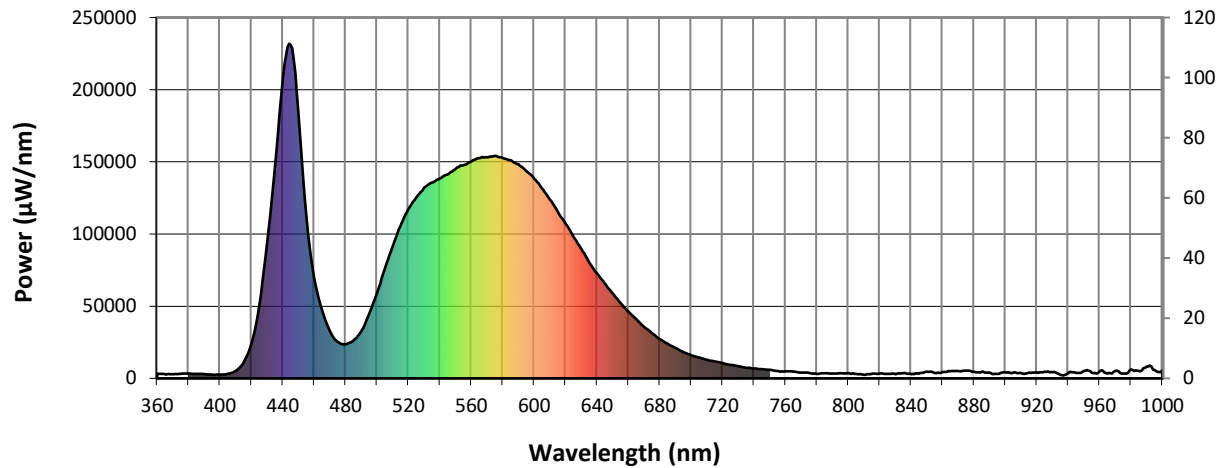
**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 5000K 4-step quadrangle

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### Photopic Flux vs. Wavelength

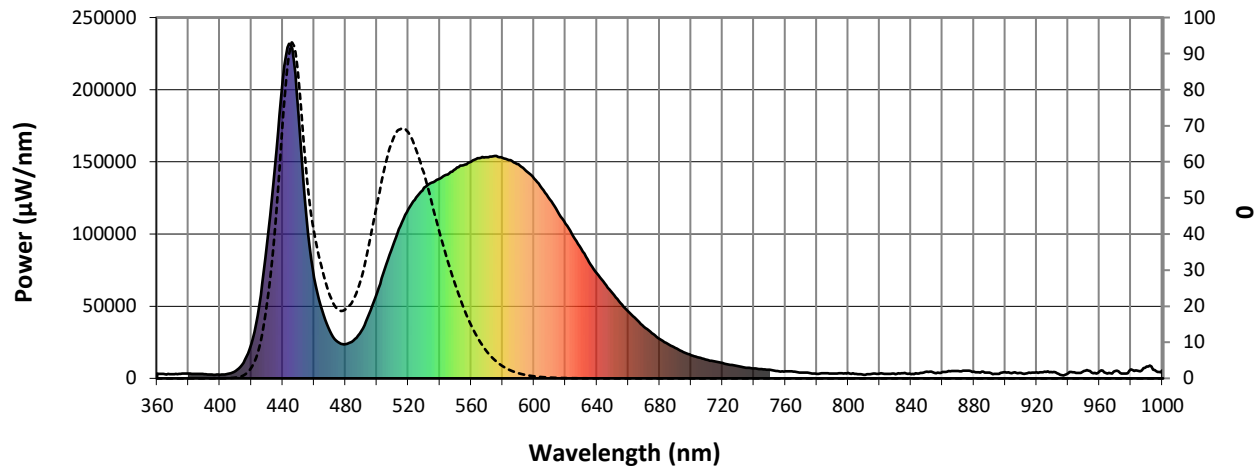


#####

| 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



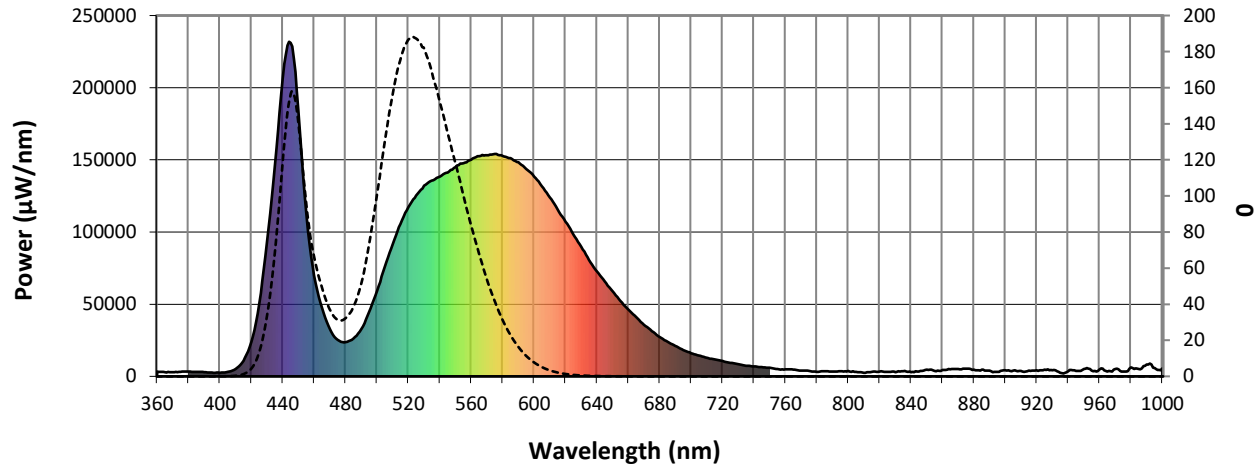
Scotopic Lumens: 15745.7

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**

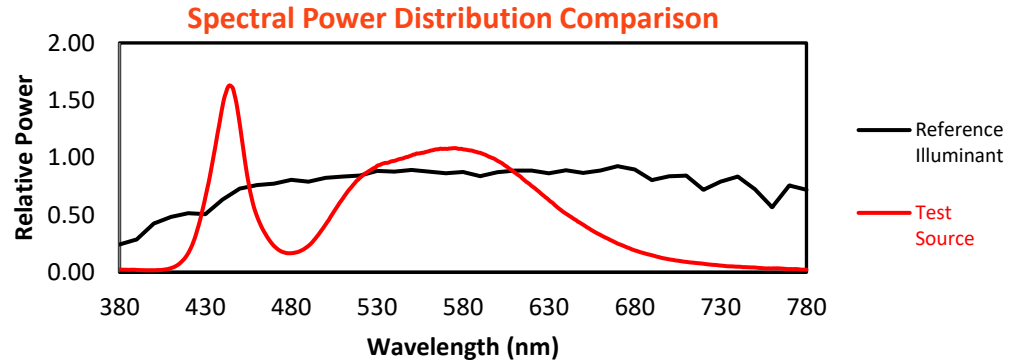
| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 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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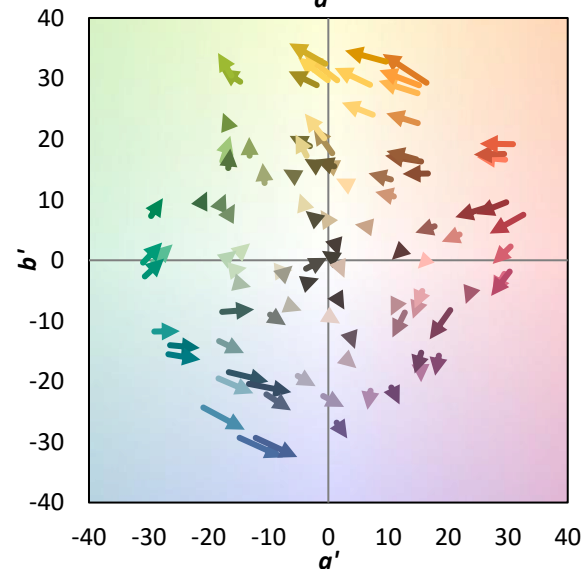
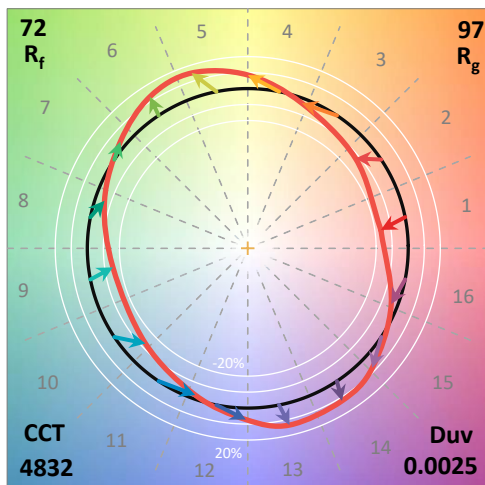
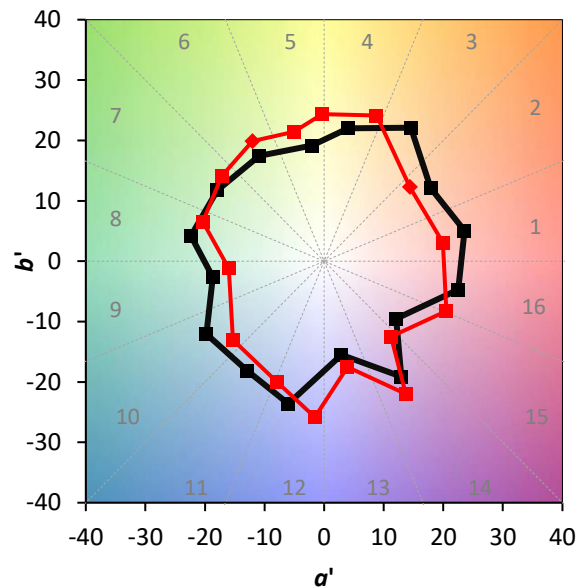
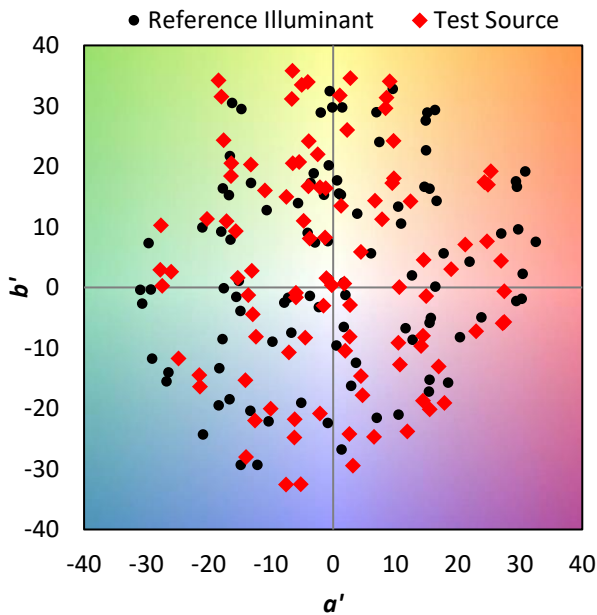
TM-30-18

### Summary

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



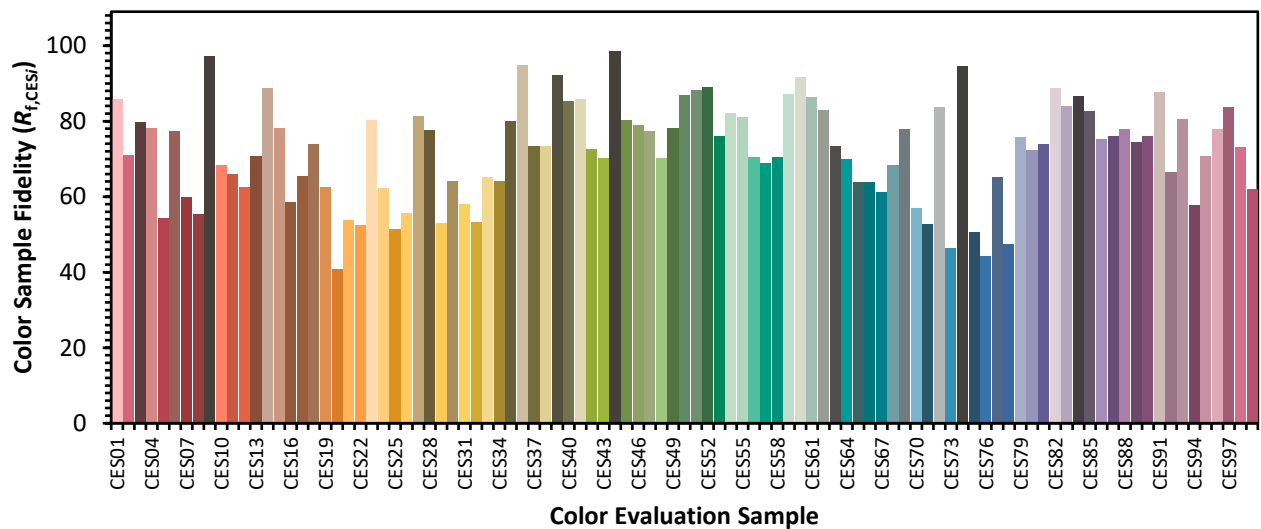
### Color Vector Graphics



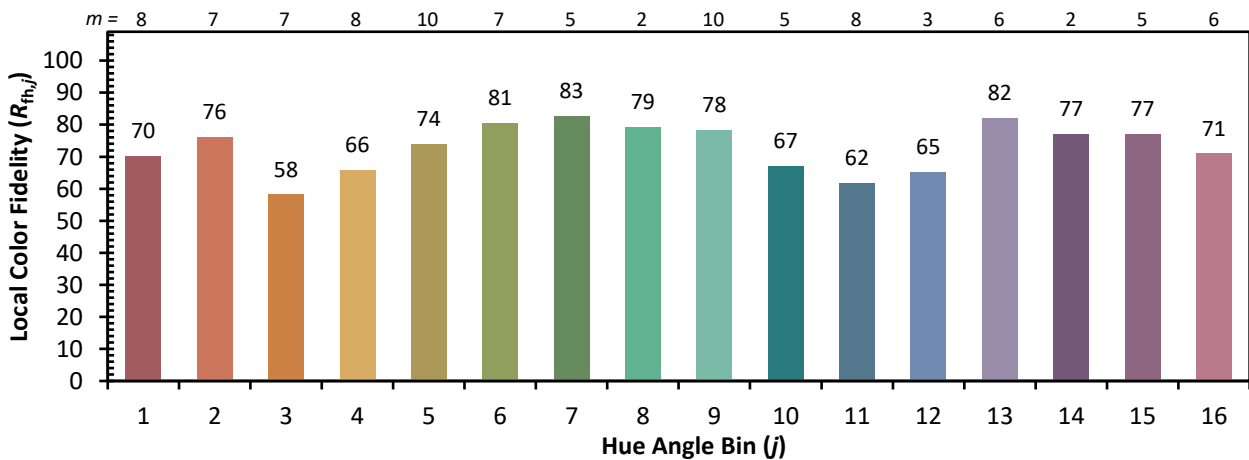
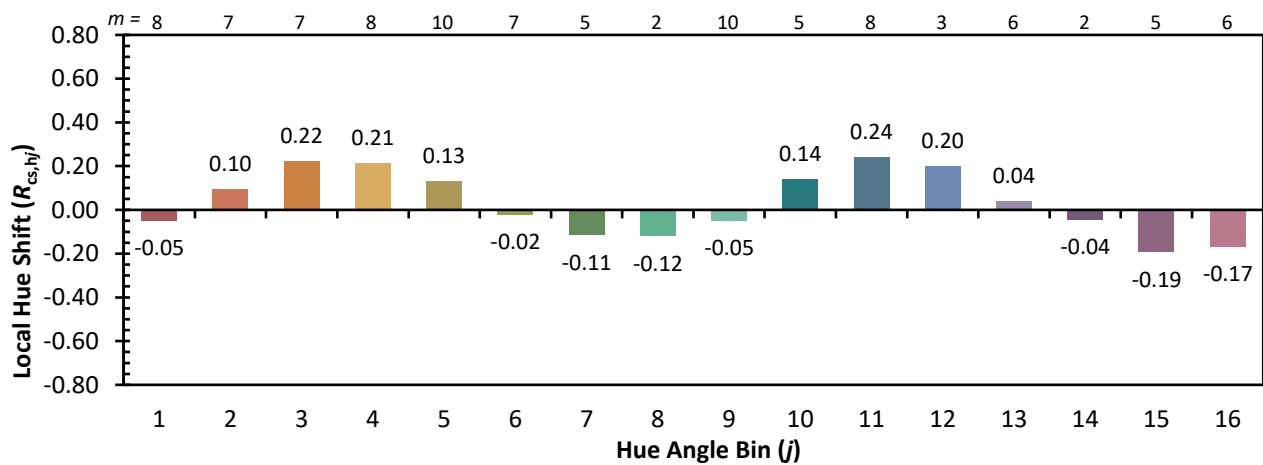
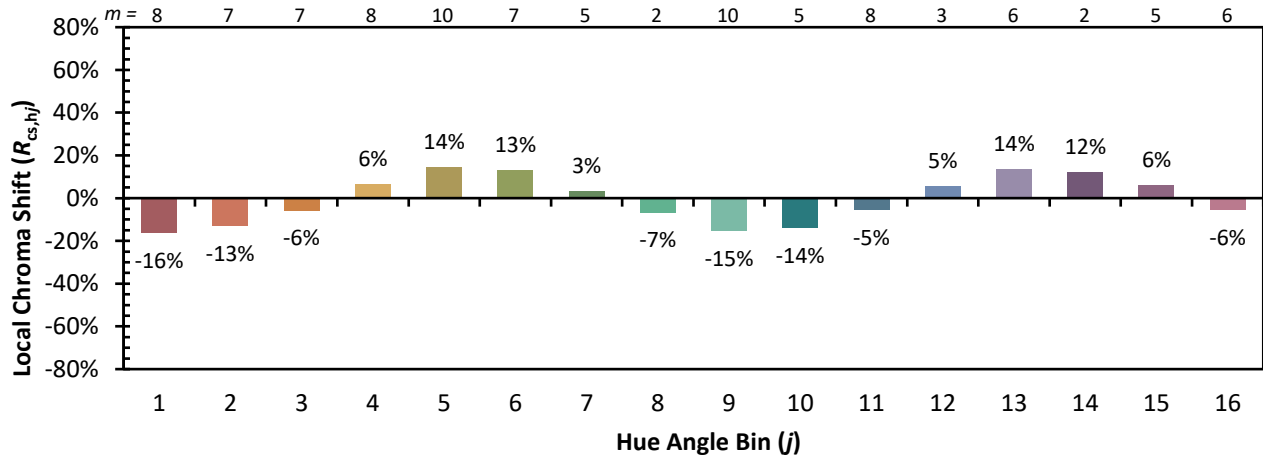


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

|            |            |            |            |
|------------|------------|------------|------------|
| 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 |            |



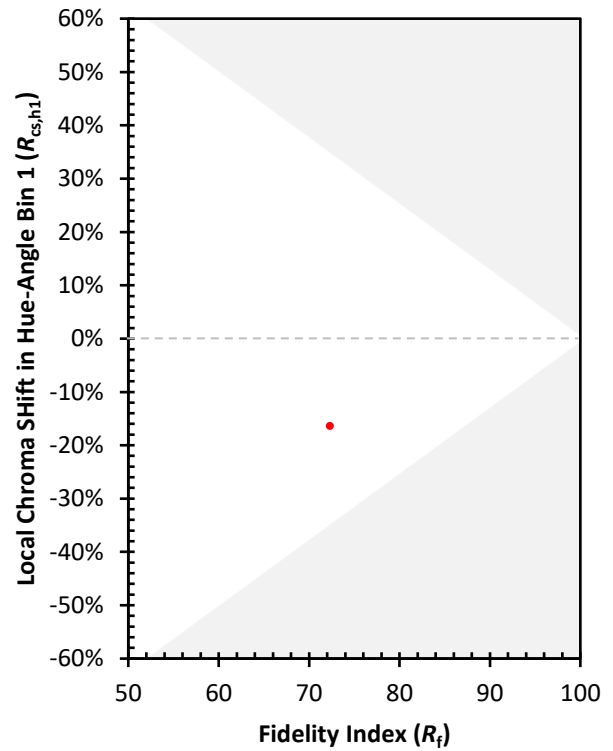
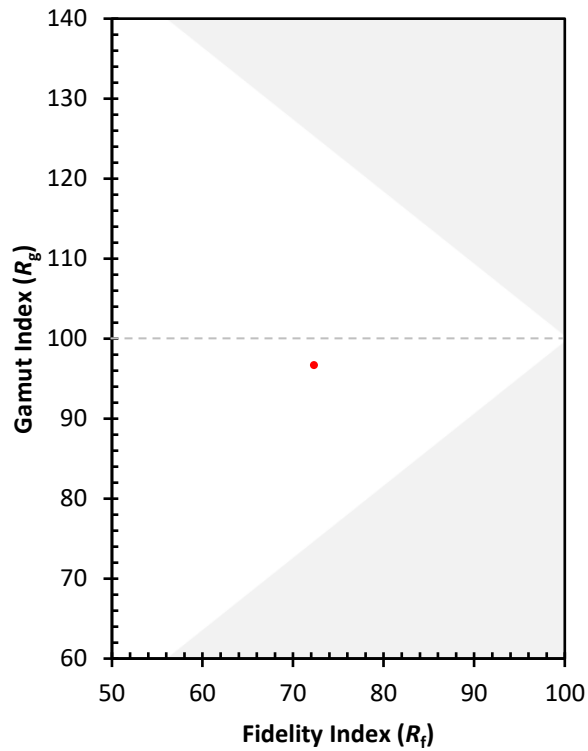
Color Rendition by Hue-Angle Bin



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**TM-30-18**

**Measure Comparisons**



(END OF REPORT)