

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



Scaled data based on original data using  
LM-79-2019 Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Test Report Prepared for  
Cooper Lighting Solutions

Brand: STREETWORKS

Report Number: P359278

Luminaire Tested: NVN-SA6C-730-U-T3

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-2019  
Report Number: P359278  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-14)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: STREETWORKS  
Catalog Number: NVN-SA6C-730-U-T3  
Description: NAVION ROADWAY AND AREA LUMINAIRE  
(6) 70 CRI, 3000K, 1050mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE III OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 38992 lumens  
Efficiency: N/A  
Efficacy: 117.1 lumens/watt  
Luminous Opening: Rectangular (W 1' x L: 1.5' x H: 0')  
IES Classification: Type III - Short  
BUG Rating: B3 - U0 - G5

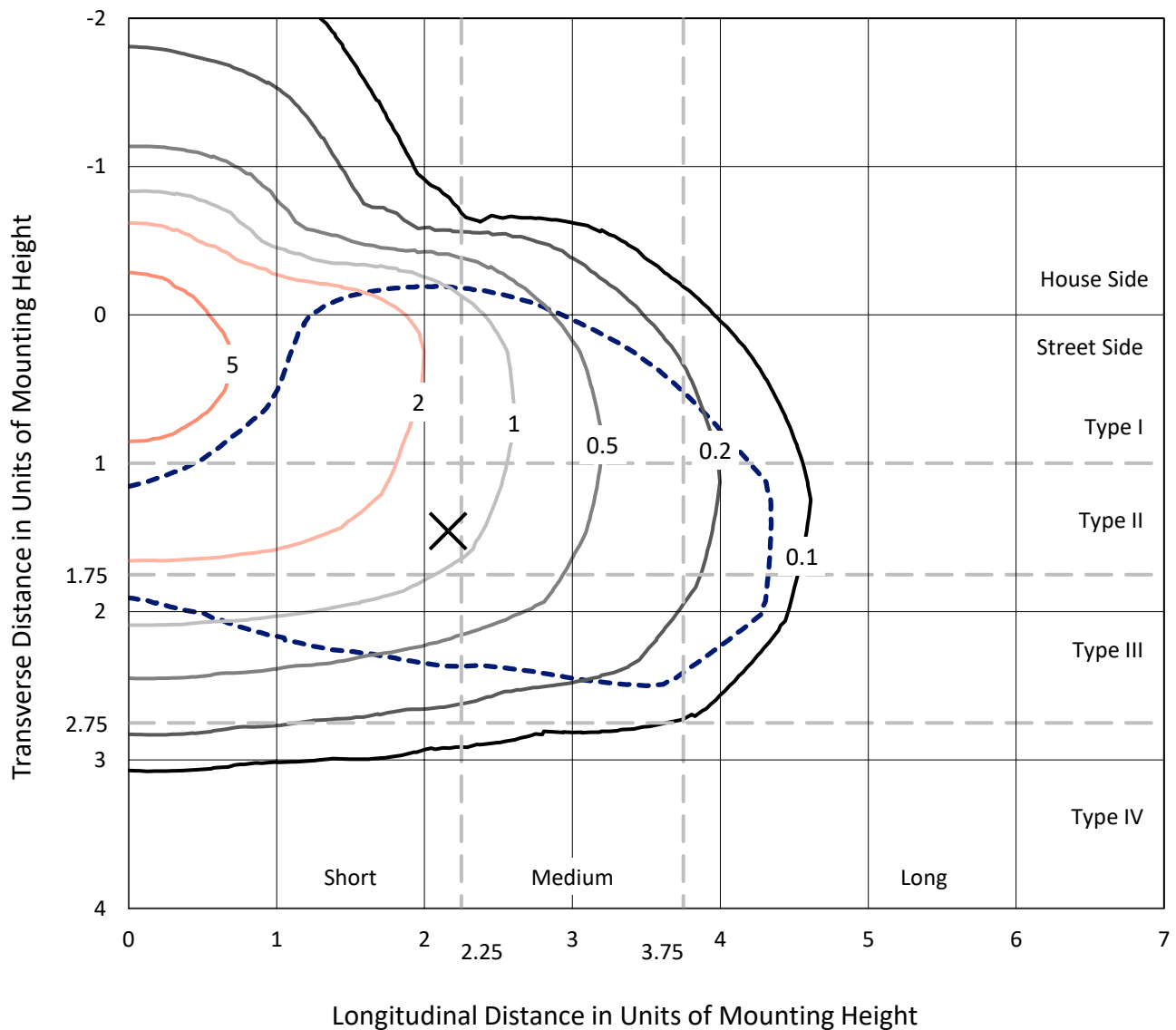
Input Watts (W): 333  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 28.75 FT



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## Iso-Footcandle Lines of Horizontal Illumination

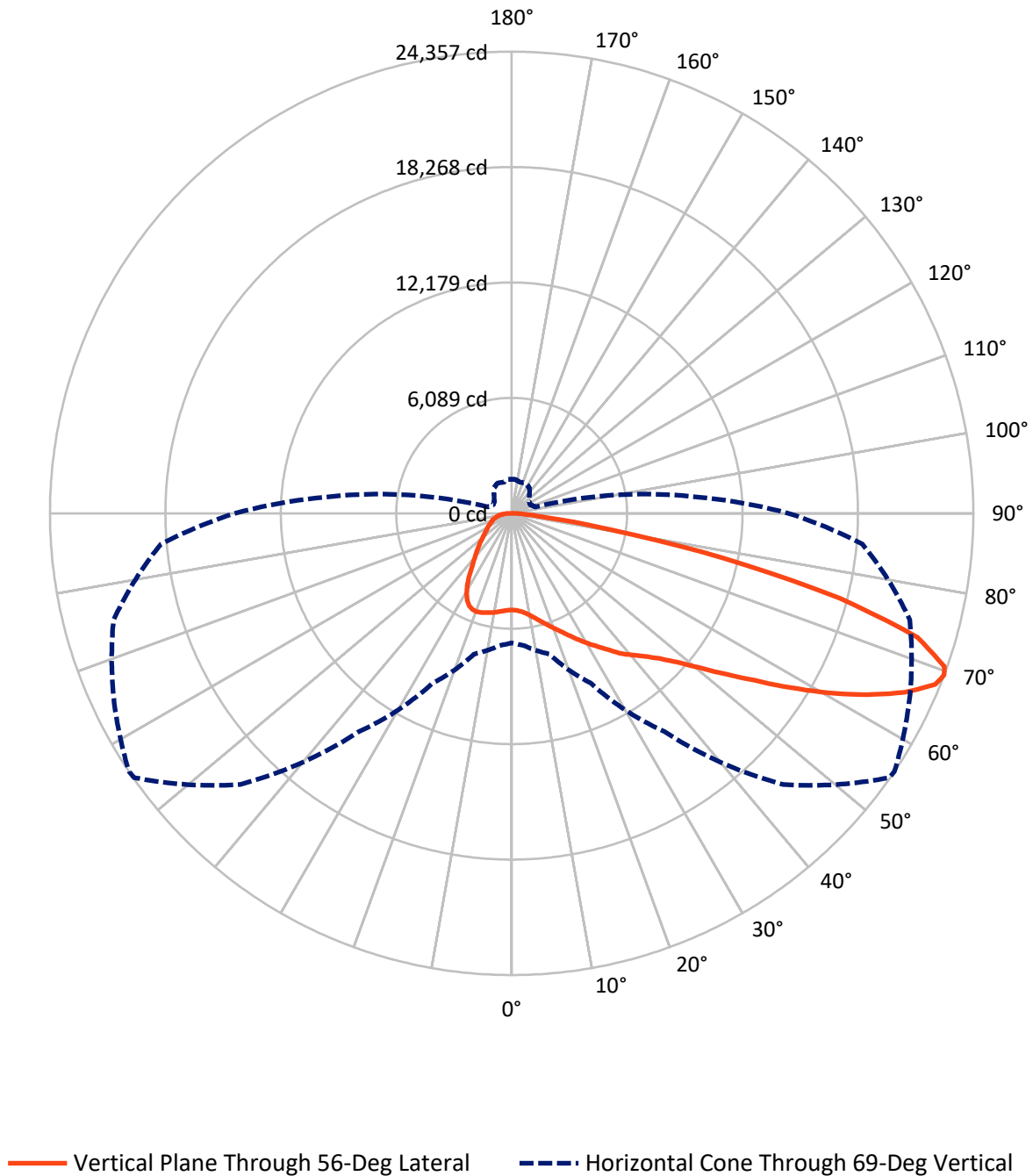
✕ Max cd  
 - - - 1/2 Max cd



Based on 30 foot mounting height. Maximum calculated value = 6.2 fc  
 Type III - Short - N/A

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## Luminous Intensity Polar Plot



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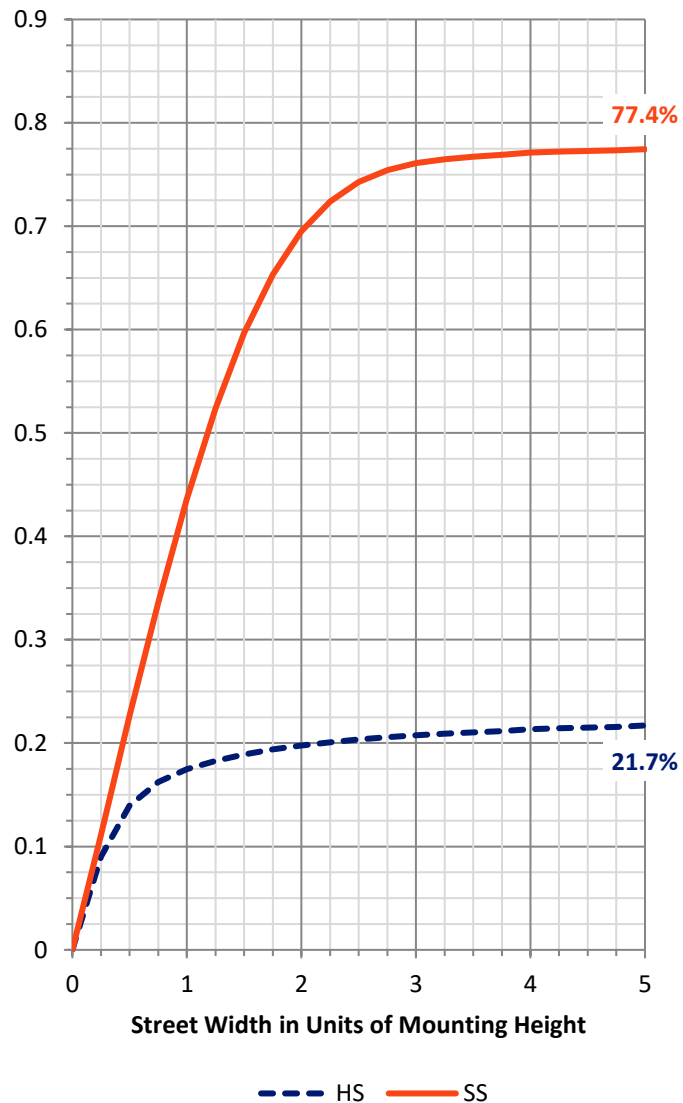
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 8683.5   | 0.0    | 8683.5  |
|                    | % Fixture | 22.3     | 0.0    | 22.3    |
| <b>Street Side</b> | Lumens    | 30308.5  | 0.0    | 30308.5 |
|                    | % Fixture | 77.7     | 0.0    | 77.7    |
| <b>Total</b>       | Lumens    | 38992.0  | 0.0    | 38992.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 500.7   | 1.3       |
| 10°-20°   | 1609.9  | 4.1       |
| 20°-30°   | 2810.3  | 7.2       |
| 30°-40°   | 4037.0  | 10.4      |
| 40°-50°   | 5586.9  | 14.3      |
| 50°-60°   | 8185.6  | 21.0      |
| 60°-70°   | 9979.8  | 25.6      |
| 70°-80°   | 5517.5  | 14.2      |
| 80°-90°   | 764.2   | 2.0       |
| 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°    | 38992.0 | 100.0     |
| 0°-180°   | 38992.0 | 100.0     |

**Coefficient of Utilization**



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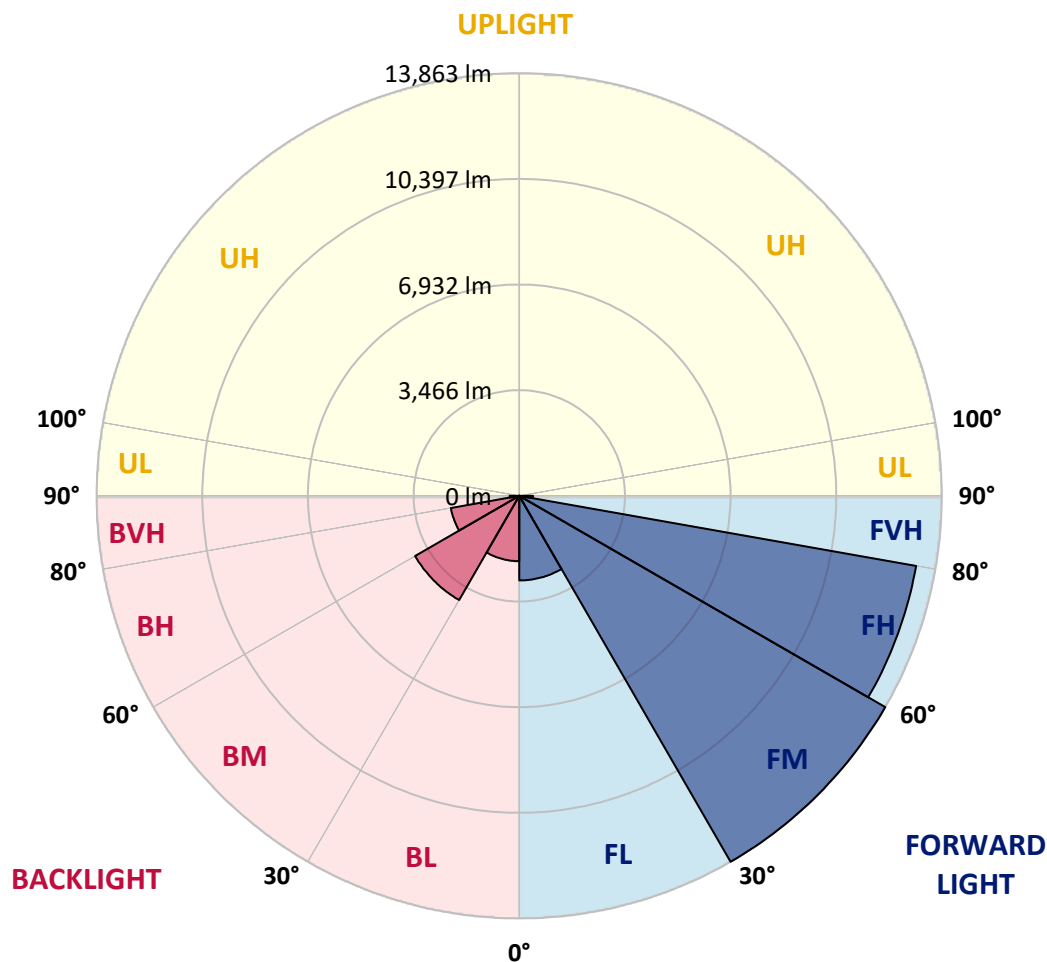
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**LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:**

| Zone |             | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|---------|-----------|-------------------------|------|---------|
|      |             |         |           | B                       | U    | G       |
| FL   | (0°-30°)    | 2775.1  | 7.1       |                         |      |         |
| FM   | (30°-60°)   | 13863.1 | 35.6      |                         |      |         |
| FH   | (60°-80°)   | 13220.2 | 33.9      |                         |      | G5      |
| FVH  | (80°-90°)   | 450.1   | 1.2       |                         |      | G3/500  |
| BL   | (0°-30°)    | 2145.9  | 5.5       | B3/2500                 |      |         |
| BM   | (30°-60°)   | 3946.4  | 10.1      | B3/5000                 |      |         |
| BH   | (60°-80°)   | 2277.1  | 5.8       | B3/2500                 |      | G3/2500 |
| BVH  | (80°-90°)   | 314.1   | 0.8       |                         |      | G3/500  |
| UL   | (90°-100°)  | 0.0     | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0     | 0.0       |                         | U0/0 |         |

**BUG Rating: B3-U0-G5**

Type III Short





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 45°     | 55°     | 56°     | 65°     | 75°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 5097.6  | 5097.6  | 5097.6  | 5097.6  | 5097.6  | 5097.6  | 5097.6  | 5097.6  | 5097.6  | 5097.6  | 5097.6  |
| 2.5°  | 5129.9  | 5135.2  | 5131.2  | 5141.9  | 5129.9  | 5137.9  | 5131.2  | 5131.2  | 5127.2  | 5115.1  | 5101.6  |
| 5°    | 5210.4  | 5221.2  | 5214.5  | 5225.2  | 5210.4  | 5213.1  | 5201.0  | 5201.0  | 5189.0  | 5163.4  | 5136.6  |
| 7.5°  | 5336.7  | 5348.8  | 5343.4  | 5354.2  | 5334.0  | 5334.0  | 5317.9  | 5316.6  | 5292.4  | 5250.7  | 5219.9  |
| 10°   | 5487.2  | 5503.3  | 5497.9  | 5514.0  | 5497.9  | 5503.3  | 5487.2  | 5487.2  | 5454.9  | 5395.8  | 5356.9  |
| 12.5° | 5706.1  | 5726.3  | 5711.5  | 5710.1  | 5703.4  | 5714.2  | 5700.7  | 5698.0  | 5668.5  | 5587.9  | 5534.2  |
| 15°   | 5998.9  | 6020.4  | 5989.5  | 5986.8  | 5949.2  | 5945.2  | 5945.2  | 5941.2  | 5922.4  | 5825.7  | 5737.0  |
| 17.5° | 6336.1  | 6342.8  | 6315.9  | 6273.0  | 6224.6  | 6193.7  | 6189.7  | 6200.4  | 6200.4  | 6087.6  | 5946.5  |
| 20°   | 6666.5  | 6678.6  | 6657.1  | 6608.8  | 6547.0  | 6501.3  | 6469.1  | 6490.6  | 6489.2  | 6354.9  | 6154.8  |
| 22.5° | 7026.5  | 7054.7  | 7022.5  | 6960.7  | 6888.2  | 6837.1  | 6780.7  | 6799.5  | 6800.9  | 6635.6  | 6358.9  |
| 25°   | 7492.6  | 7467.1  | 7447.0  | 7359.6  | 7256.2  | 7203.8  | 7151.4  | 7170.2  | 7164.9  | 6937.9  | 6569.8  |
| 27.5° | 7905.0  | 7910.4  | 7883.5  | 7790.8  | 7671.3  | 7555.8  | 7553.1  | 7565.2  | 7545.0  | 7252.2  | 6768.6  |
| 30°   | 8384.5  | 8387.2  | 8349.6  | 8266.3  | 8136.0  | 7986.9  | 7952.0  | 7972.2  | 7929.2  | 7550.4  | 6978.2  |
| 32.5° | 8861.4  | 8874.8  | 8833.2  | 8732.4  | 8627.7  | 8446.3  | 8376.5  | 8389.9  | 8282.5  | 7855.3  | 7194.4  |
| 35°   | 9279.1  | 9297.9  | 9284.5  | 9217.4  | 9103.2  | 8947.4  | 8864.1  | 8856.0  | 8723.0  | 8228.7  | 7480.5  |
| 37.5° | 9704.9  | 9722.4  | 9707.6  | 9651.2  | 9605.5  | 9440.3  | 9396.0  | 9396.0  | 9165.0  | 8610.2  | 7844.6  |
| 40°   | 10142.8 | 10169.7 | 10152.3 | 10074.3 | 10035.4 | 9960.2  | 9854.0  | 9828.5  | 9578.7  | 9068.3  | 8438.3  |
| 42.5° | 10549.9 | 10584.8 | 10654.6 | 10609.0 | 10529.7 | 10540.4 | 10326.9 | 10313.4 | 10130.8 | 9745.2  | 9183.8  |
| 45°   | 11127.4 | 11178.5 | 11296.7 | 11261.8 | 11245.7 | 11186.5 | 10932.7 | 10920.6 | 10850.7 | 10656.0 | 10109.3 |
| 47.5° | 11757.4 | 11827.3 | 12040.9 | 12047.6 | 12220.8 | 12109.4 | 11764.1 | 11722.5 | 11738.6 | 11746.7 | 11238.9 |
| 50°   | 12337.7 | 12414.3 | 12764.9 | 12930.1 | 13338.4 | 13362.6 | 12810.5 | 12772.9 | 12836.1 | 13021.4 | 12555.3 |
| 52.5° | 12801.1 | 12897.8 | 13335.7 | 13846.2 | 14546.0 | 14744.8 | 14098.7 | 14070.5 | 14117.5 | 14437.2 | 14043.6 |
| 55°   | 13141.0 | 13245.7 | 13722.6 | 14652.1 | 15769.7 | 16120.3 | 15581.6 | 15554.8 | 15584.3 | 15991.3 | 15662.2 |
| 57.5° | 13220.2 | 13245.7 | 13937.5 | 15194.8 | 16802.7 | 17644.9 | 17396.4 | 17342.6 | 17197.6 | 17552.2 | 17448.8 |
| 60°   | 12848.1 | 12950.2 | 13760.2 | 15385.5 | 17601.9 | 19148.0 | 19293.0 | 19225.9 | 18818.9 | 19109.0 | 19025.7 |
| 62.5° | 12093.2 | 12275.9 | 13098.0 | 15095.4 | 17914.9 | 20375.7 | 21153.4 | 21072.8 | 20371.7 | 20559.7 | 20159.4 |
| 65°   | 10860.1 | 10938.0 | 11801.8 | 14094.7 | 17517.3 | 21161.5 | 22812.3 | 22772.0 | 21889.5 | 21595.4 | 20369.0 |
| 67.5° | 8654.5  | 8800.9  | 9534.4  | 12003.2 | 15890.6 | 21068.8 | 24095.1 | 24091.1 | 22880.8 | 21979.5 | 19626.2 |
| 69°   | 6837.1  | 6988.9  | 7687.4  | 9887.6  | 14061.1 | 20221.2 | 24310.1 | 24357.1 | 23160.2 | 21745.8 | 18565.0 |
| 70°   | 5450.9  | 5626.9  | 6106.4  | 8328.1  | 12437.1 | 19103.6 | 24131.4 | 24216.0 | 23106.5 | 21360.3 | 17585.8 |
| 72.5° | 2319.8  | 2462.2  | 2803.4  | 4293.0  | 7579.9  | 14265.3 | 22064.2 | 22383.8 | 21861.3 | 19549.6 | 14533.9 |
| 75°   | 1012.8  | 1057.1  | 1211.6  | 1750.2  | 3364.8  | 7764.0  | 17284.9 | 17875.9 | 18692.6 | 16524.6 | 10826.6 |
| 77.5° | 741.5   | 760.3   | 844.9   | 1027.6  | 1509.8  | 2932.3  | 11115.4 | 11459.2 | 13480.8 | 12024.7 | 6641.0  |
| 80°   | 573.6   | 587.0   | 652.8   | 754.9   | 985.9   | 1186.1  | 5069.4  | 5364.9  | 7579.9  | 6176.2  | 2765.7  |
| 82.5° | 456.7   | 466.1   | 511.8   | 556.1   | 681.0   | 718.6   | 1683.1  | 1867.1  | 2798.0  | 1705.9  | 732.1   |
| 85°   | 424.5   | 435.2   | 451.3   | 405.7   | 436.6   | 421.8   | 728.0   | 761.6   | 844.9   | 670.3   | 306.3   |
| 87.5° | 192.1   | 227.0   | 447.3   | 315.7   | 232.4   | 185.4   | 298.2   | 311.6   | 350.6   | 351.9   | 135.7   |
| 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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**CANDELA DISTRIBUTION (continued):**

|       | 90°     | 95°     | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|---------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 5097.6  | 5097.6  | 5097.6 | 5097.6 | 5097.6 | 5097.6 | 5097.6 | 5097.6 | 5097.6 | 5097.6 | 5097.6 |
| 2.5°  | 5109.7  | 5105.7  | 5112.4 | 5096.3 | 5116.4 | 5115.1 | 5108.4 | 5111.0 | 5124.5 | 5123.1 | 5124.5 |
| 5°    | 5140.6  | 5137.9  | 5146.0 | 5133.9 | 5158.1 | 5166.1 | 5167.5 | 5179.6 | 5194.3 | 5198.4 | 5198.4 |
| 7.5°  | 5218.5  | 5218.5  | 5222.5 | 5206.4 | 5222.5 | 5221.2 | 5214.5 | 5226.6 | 5241.3 | 5242.7 | 5241.3 |
| 10°   | 5352.8  | 5354.2  | 5347.5 | 5305.8 | 5292.4 | 5256.1 | 5222.5 | 5223.9 | 5242.7 | 5257.5 | 5261.5 |
| 12.5° | 5522.1  | 5516.7  | 5487.2 | 5410.6 | 5354.2 | 5280.3 | 5245.4 | 5244.0 | 5262.8 | 5274.9 | 5279.0 |
| 15°   | 5715.5  | 5700.7  | 5624.2 | 5499.2 | 5399.8 | 5327.3 | 5270.9 | 5257.5 | 5246.7 | 5233.3 | 5234.6 |
| 17.5° | 5898.2  | 5864.6  | 5737.0 | 5563.7 | 5459.0 | 5362.2 | 5253.4 | 5166.1 | 5105.7 | 5070.8 | 5060.0 |
| 20°   | 6083.6  | 6017.7  | 5833.7 | 5624.2 | 5491.2 | 5315.2 | 5105.7 | 4928.4 | 4818.2 | 4767.2 | 4757.8 |
| 22.5° | 6252.8  | 6146.7  | 5923.7 | 5687.3 | 5465.7 | 5156.7 | 4827.6 | 4569.7 | 4416.6 | 4348.1 | 4353.5 |
| 25°   | 6418.0  | 6270.3  | 6017.7 | 5731.6 | 5336.7 | 4877.3 | 4440.8 | 4123.8 | 3946.5 | 3869.9 | 3867.2 |
| 27.5° | 6563.1  | 6395.2  | 6119.8 | 5695.4 | 5096.3 | 4479.7 | 3982.7 | 3673.8 | 3526.0 | 3460.2 | 3449.5 |
| 30°   | 6729.7  | 6552.4  | 6255.5 | 5557.0 | 4744.3 | 4020.3 | 3535.4 | 3317.8 | 3213.0 | 3147.2 | 3135.1 |
| 32.5° | 6932.5  | 6765.9  | 6367.0 | 5305.8 | 4294.4 | 3540.8 | 3186.2 | 3034.4 | 2939.0 | 2865.1 | 2851.7 |
| 35°   | 7228.0  | 7048.0  | 6395.2 | 4945.8 | 3800.0 | 3162.0 | 2929.6 | 2773.8 | 2644.9 | 2549.5 | 2540.1 |
| 37.5° | 7598.7  | 7401.3  | 6330.7 | 4479.7 | 3320.5 | 2916.2 | 2716.0 | 2524.0 | 2356.1 | 2221.7 | 2200.2 |
| 40°   | 8133.4  | 7835.2  | 6152.1 | 3942.4 | 2967.2 | 2726.8 | 2507.8 | 2288.9 | 2080.7 | 1923.5 | 1892.6 |
| 42.5° | 8775.4  | 8344.2  | 5878.0 | 3407.8 | 2708.0 | 2534.7 | 2301.0 | 2029.6 | 1830.8 | 1719.4 | 1703.2 |
| 45°   | 9592.1  | 8873.5  | 5497.9 | 2940.4 | 2452.8 | 2342.6 | 2078.0 | 1828.2 | 1704.6 | 1622.6 | 1609.2 |
| 47.5° | 10524.3 | 9467.2  | 5099.0 | 2560.2 | 2236.5 | 2162.6 | 1899.3 | 1738.2 | 1640.1 | 1575.6 | 1563.5 |
| 50°   | 11670.1 | 10137.5 | 4675.8 | 2248.6 | 2018.9 | 1946.4 | 1814.7 | 1688.5 | 1610.6 | 1560.9 | 1548.8 |
| 52.5° | 12962.3 | 10893.7 | 4370.9 | 2002.8 | 1838.9 | 1786.5 | 1770.4 | 1661.6 | 1598.5 | 1560.9 | 1548.8 |
| 55°   | 14353.9 | 11663.4 | 4041.8 | 1795.9 | 1683.1 | 1697.9 | 1740.8 | 1664.3 | 1621.3 | 1575.6 | 1558.2 |
| 57.5° | 15746.9 | 12458.6 | 3675.1 | 1621.3 | 1559.5 | 1632.0 | 1720.7 | 1669.7 | 1633.4 | 1589.1 | 1572.9 |
| 60°   | 16848.3 | 12962.3 | 3106.9 | 1474.9 | 1461.5 | 1559.5 | 1672.3 | 1629.4 | 1582.3 | 1583.7 | 1581.0 |
| 62.5° | 17362.8 | 12935.5 | 2479.6 | 1344.6 | 1363.4 | 1461.5 | 1594.4 | 1566.2 | 1527.3 | 1579.7 | 1583.7 |
| 65°   | 17074.0 | 12290.7 | 1930.2 | 1226.4 | 1258.6 | 1359.4 | 1513.8 | 1535.3 | 1548.8 | 1649.5 | 1662.9 |
| 67.5° | 15862.4 | 11036.1 | 1495.0 | 1123.0 | 1163.3 | 1289.5 | 1521.9 | 1672.3 | 1689.8 | 1795.9 | 1794.6 |
| 69°   | 14609.1 | 9859.4  | 1298.9 | 1069.2 | 1116.2 | 1307.0 | 1626.7 | 1759.7 | 1693.8 | 1806.7 | 1790.5 |
| 70°   | 13558.7 | 8928.6  | 1194.1 | 1033.0 | 1094.7 | 1337.9 | 1696.5 | 1758.3 | 1673.7 | 1770.4 | 1743.5 |
| 72.5° | 10442.4 | 6423.4  | 1012.8 | 965.8  | 1022.2 | 1280.1 | 1716.7 | 1719.4 | 1626.7 | 1645.5 | 1599.8 |
| 75°   | 7162.2  | 4059.3  | 883.9  | 874.5  | 912.1  | 1153.8 | 1652.2 | 1642.8 | 1504.4 | 1477.6 | 1440.0 |
| 77.5° | 3949.1  | 2061.9  | 750.9  | 787.1  | 812.7  | 1022.2 | 1501.7 | 1488.3 | 1374.1 | 1317.7 | 1304.3 |
| 80°   | 1523.2  | 902.7   | 634.0  | 699.8  | 715.9  | 885.2  | 1316.4 | 1304.3 | 1208.9 | 1136.4 | 1116.2 |
| 82.5° | 574.9   | 472.8   | 523.9  | 605.8  | 600.4  | 730.7  | 1114.9 | 1108.2 | 1015.5 | 909.4  | 877.1  |
| 85°   | 266.0   | 283.4   | 415.1  | 499.7  | 460.7  | 541.3  | 891.9  | 904.0  | 791.2  | 664.9  | 664.9  |
| 87.5° | 112.8   | 158.5   | 294.2  | 377.5  | 310.3  | 365.4  | 654.2  | 624.6  | 573.6  | 397.6  | 373.4  |
| 90°   | 0.0     | 0.0     | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |



LM-79-2008: Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Report Prepared for

Cooper Lighting Solutions

McGRAW-EDISON

Report Number: SP1-1908-441-2-R4

Test Date: 10/03/2019

Luminaire Tested: SA1C-730-U-5WQ

Data in this report applies to families of products SA1C-730-U-5WQ .

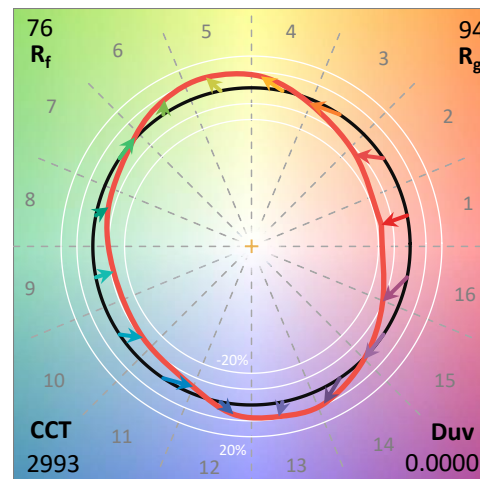
### Test Information

Test Method: LM-79-2008  
 Report Number: SP1-1908-441-2-R4  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry:  $4\pi$   
 Issue Date: 10/28/2024  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: MCGRAW-EDISON  
 Catalog Number: **SA1C-730-U-5WQ**  
 Description: MCGRAW EDISON ROADWAY AND AREA LUMINAIRE

\*\*\*THIS IS A REVISION OF SP1-1908-441-2-R3. TO UPDATE THE CATALOG INFORMATION.\*\*\*TESTED IN SITU. (1) 70 CRI, 3000K, 1050MA LIGHTSQUARE WITH 16 LEDS AND TYPE V WIDE OPTICS.

### Spectral Parameters

|                           |        |           |      |      |       |
|---------------------------|--------|-----------|------|------|-------|
| CCT (K):                  | 2993   | CRI (Ra): | 71.8 |      |       |
| CIE u':                   | 0.2508 | R1:       | 67.5 | R9:  | -38.3 |
| CIE v':                   | 0.5215 | R2:       | 82.9 | R10: | 62.5  |
| Duv:                      | 0.0000 | R3:       | 94.7 | R11: | 63.7  |
| CIE x:                    | 0.4374 | R4:       | 67.7 | R12: | 57.8  |
| CIE y:                    | 0.4043 | R5:       | 67.9 | R13: | 70.4  |
| CIE z:                    | 0.1583 | R6:       | 77.6 | R14: | 97.3  |
| Peak Wavelength (nm):     | 593    | R7:       | 76.0 |      |       |
| Dominant Wavelength (nm): | 582    | R8:       | 40.5 |      |       |
| Purity:                   | 53     |           |      |      |       |
| Rf:                       | 75.7   |           |      |      |       |
| Rg:                       | 93.9   |           |      |      |       |



### Test Conditions

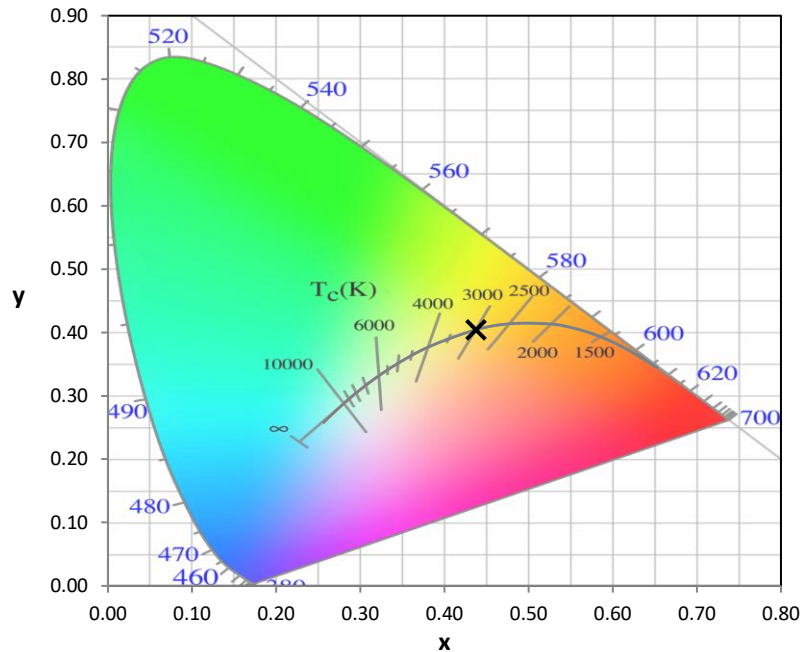
Stabilization Time: 53M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 25.0./44%  
 Sphere Temperature (°C): 25.7

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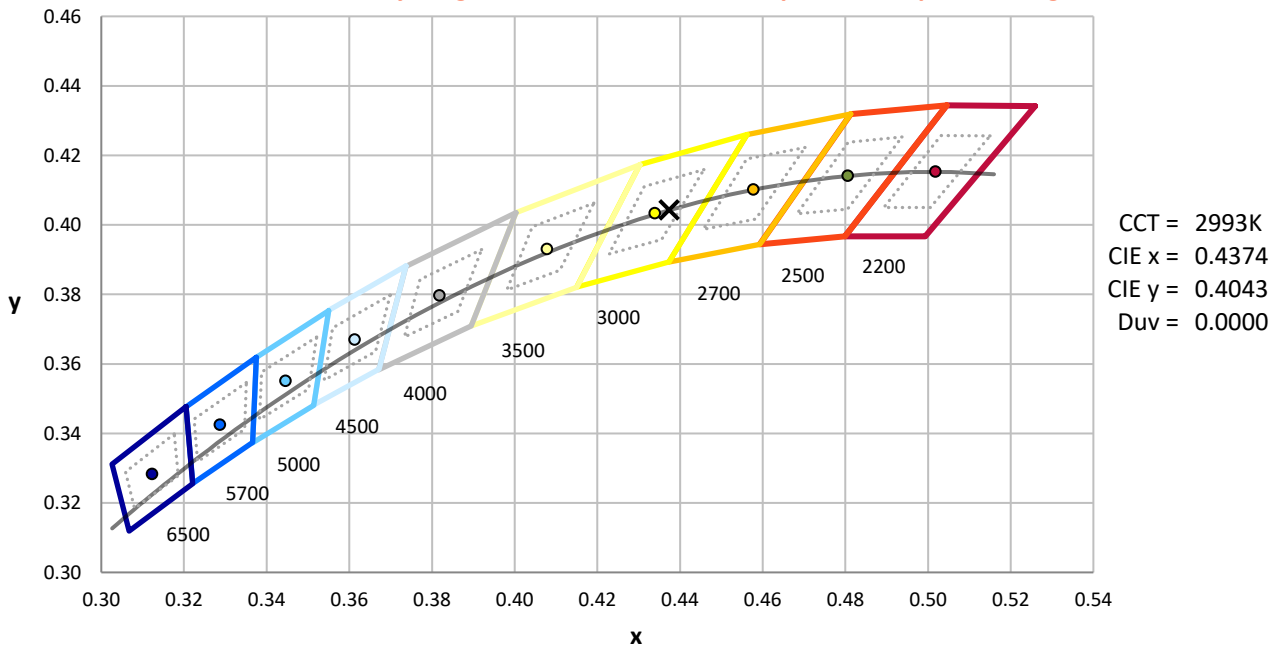
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | IN0058                | 6/28/2019        | 12/28/2019           |
| Power Meter                    | IN0071                | 12/5/2018        | 12/5/2019            |
| AC Power Source                | IN0063                | 12/5/2018        | 12/5/2019            |
| DC Power Source                | IN0208                | 12/5/2018        | 12/5/2019            |
| Sphere Thermometer             | IN0085                | 12/5/2018        | 12/5/2019            |
| Room Thermometer               | IN0046                | 12/5/2018        | 12/5/2019            |

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**CIE 1931 Chromaticity Diagram**



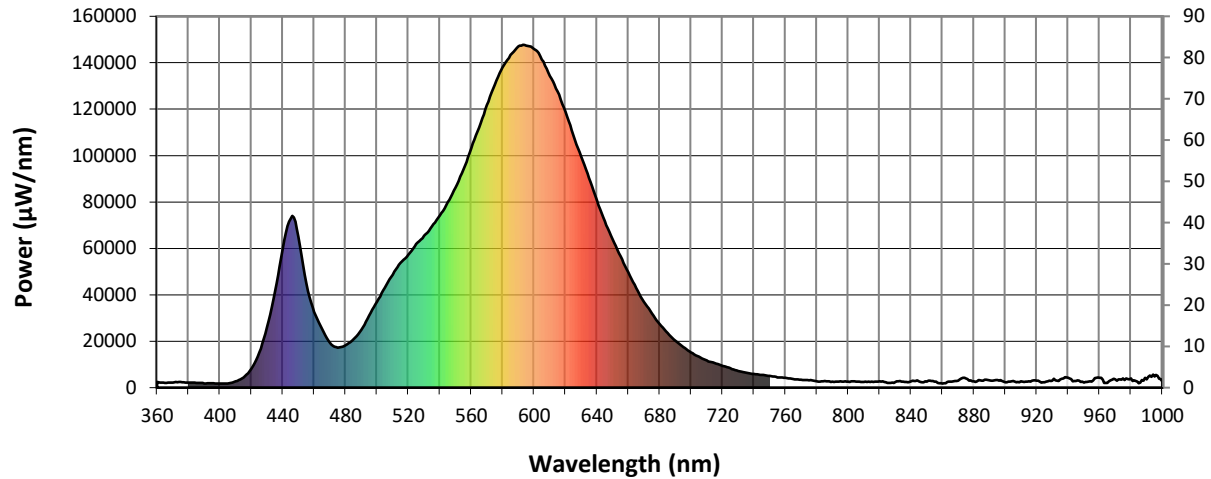
**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 3000K 4-step quadrangle

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**Photopic Flux vs. Wavelength**

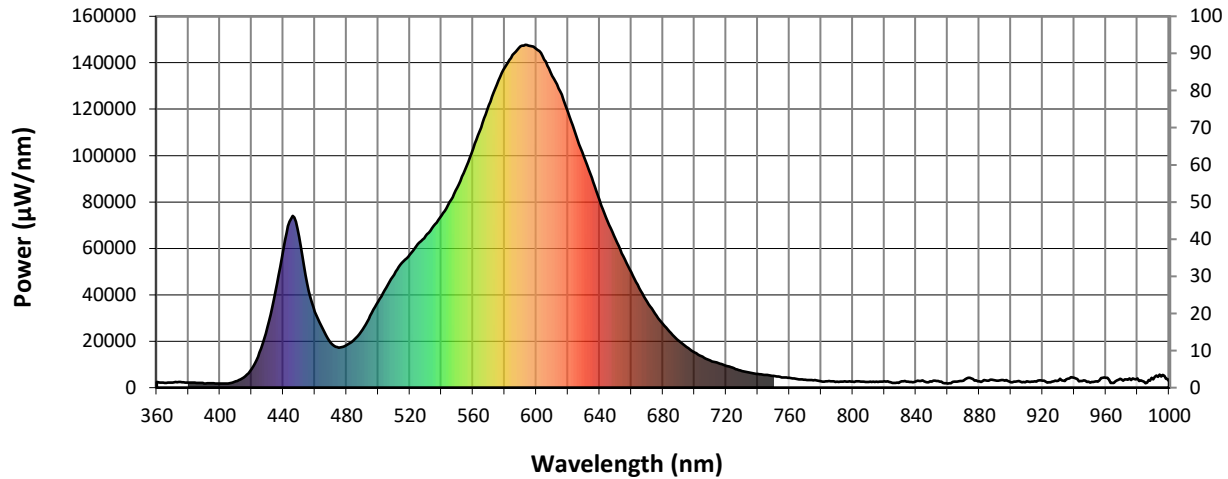


#####

| 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       | 2397             | NR               | 490       | 24908            | NR               | 620       | 118784           | NR               | 750       | 5037             | NR               | 880       | 2677             | NR               |
| 365       | 2084             | NR               | 495       | 30998            | NR               | 625       | 108951           | NR               | 755       | 4413             | NR               | 885       | 2940             | NR               |
| 370       | 2143             | NR               | 500       | 37103            | NR               | 630       | 99573            | NR               | 760       | 4189             | NR               | 890       | 3116             | NR               |
| 375       | 2413             | NR               | 505       | 42987            | NR               | 635       | 90444            | NR               | 765       | 3677             | NR               | 895       | 3345             | NR               |
| 380       | 2172             | NR               | 510       | 48702            | NR               | 640       | 80749            | NR               | 770       | 3366             | NR               | 900       | 2312             | NR               |
| 385       | 1997             | NR               | 515       | 53741            | NR               | 645       | 71664            | NR               | 775       | 3211             | NR               | 905       | 2829             | NR               |
| 390       | 1830             | NR               | 520       | 57283            | NR               | 650       | 63936            | NR               | 780       | 2682             | NR               | 910       | 2783             | NR               |
| 395       | 1861             | NR               | 525       | 61876            | NR               | 655       | 56611            | NR               | 785       | 2804             | NR               | 915       | 2662             | NR               |
| 400       | 1717             | NR               | 530       | 65398            | NR               | 660       | 49763            | NR               | 790       | 2581             | NR               | 920       | 3047             | NR               |
| 405       | 1761             | NR               | 535       | 69597            | NR               | 665       | 42891            | NR               | 795       | 2711             | NR               | 925       | 2256             | NR               |
| 410       | 2680             | NR               | 540       | 74214            | NR               | 670       | 36939            | NR               | 800       | 2609             | NR               | 930       | 2976             | NR               |
| 415       | 4374             | NR               | 545       | 79911            | NR               | 675       | 31946            | NR               | 805       | 2581             | NR               | 935       | 3503             | NR               |
| 420       | 8071             | NR               | 550       | 86153            | NR               | 680       | 27385            | NR               | 810       | 2404             | NR               | 940       | 4226             | NR               |
| 425       | 15169            | NR               | 555       | 93952            | NR               | 685       | 23504            | NR               | 815       | 2556             | NR               | 945       | 2930             | NR               |
| 430       | 26038            | NR               | 560       | 102904           | NR               | 690       | 20210            | NR               | 820       | 2742             | NR               | 950       | 2115             | NR               |
| 435       | 41316            | NR               | 565       | 112009           | NR               | 695       | 17459            | NR               | 825       | 2014             | NR               | 955       | 2634             | NR               |
| 440       | 59674            | NR               | 570       | 121662           | NR               | 700       | 15207            | NR               | 830       | 2488             | NR               | 960       | 4200             | NR               |
| 445       | 72751            | NR               | 575       | 130476           | NR               | 705       | 13322            | NR               | 835       | 2625             | NR               | 965       | 1982             | NR               |
| 450       | 65091            | NR               | 580       | 137926           | NR               | 710       | 11676            | NR               | 840       | 2754             | NR               | 970       | 3613             | NR               |
| 455       | 44894            | NR               | 585       | 143406           | NR               | 715       | 10626            | NR               | 845       | 2708             | NR               | 975       | 4034             | NR               |
| 460       | 32712            | NR               | 590       | 147039           | NR               | 720       | 9416             | NR               | 850       | 2608             | NR               | 980       | 3922             | NR               |
| 465       | 25296            | NR               | 595       | 147365           | NR               | 725       | 8333             | NR               | 855       | 2605             | NR               | 985       | 1909             | NR               |
| 470       | 19318            | NR               | 600       | 145800           | NR               | 730       | 7134             | NR               | 860       | 1765             | NR               | 990       | 3617             | NR               |
| 475       | 17265            | NR               | 605       | 141363           | NR               | 735       | 6437             | NR               | 865       | 2581             | NR               | 995       | 4767             | NR               |
| 480       | 18260            | NR               | 610       | 134199           | NR               | 740       | 5834             | NR               | 870       | 3016             | NR               | 1000      | 2528             | NR               |
| 485       | 20845            | NR               | 615       | 127683           | NR               | 745       | 5500             | NR               | 875       | 3952             | NR               |           |                  |                  |

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**Scotopic Flux vs. Wavelength**



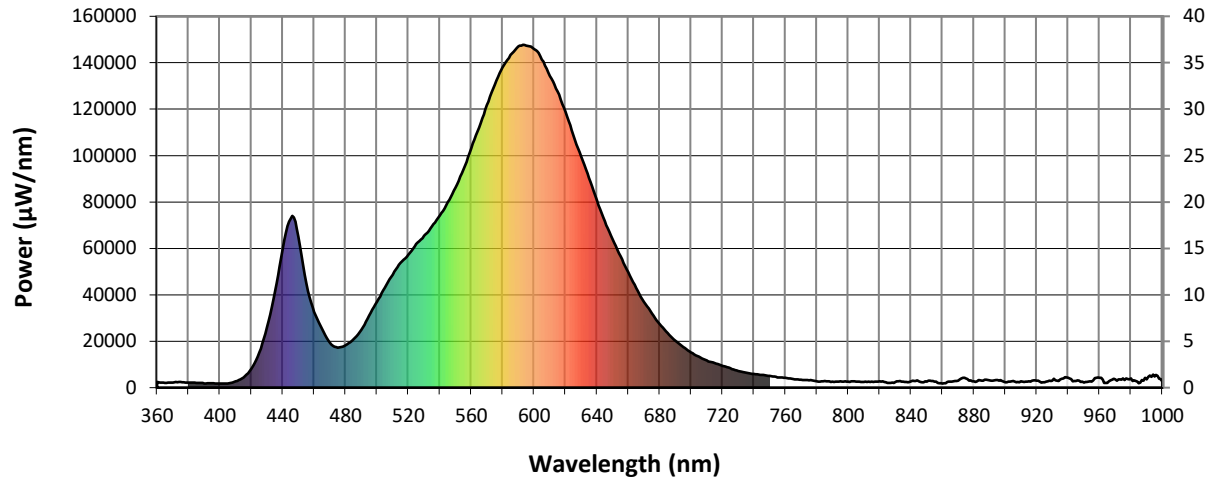
**Scotopic Lumens: 8494.8**

**S/P: 1.23**

| 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       | 2397             | NR               | 490       | 24908            | NR               | 620       | 118784           | NR               | 750       | 5037             | NR               | 880       | 2677             | NR               |
| 365       | 2084             | NR               | 495       | 30998            | NR               | 625       | 108951           | NR               | 755       | 4413             | NR               | 885       | 2940             | NR               |
| 370       | 2143             | NR               | 500       | 37103            | NR               | 630       | 99573            | NR               | 760       | 4189             | NR               | 890       | 3116             | NR               |
| 375       | 2413             | NR               | 505       | 42987            | NR               | 635       | 90444            | NR               | 765       | 3677             | NR               | 895       | 3345             | NR               |
| 380       | 2172             | NR               | 510       | 48702            | NR               | 640       | 80749            | NR               | 770       | 3366             | NR               | 900       | 2312             | NR               |
| 385       | 1997             | NR               | 515       | 53741            | NR               | 645       | 71664            | NR               | 775       | 3211             | NR               | 905       | 2829             | NR               |
| 390       | 1830             | NR               | 520       | 57283            | NR               | 650       | 63936            | NR               | 780       | 2682             | NR               | 910       | 2783             | NR               |
| 395       | 1861             | NR               | 525       | 61876            | NR               | 655       | 56611            | NR               | 785       | 2804             | NR               | 915       | 2662             | NR               |
| 400       | 1717             | NR               | 530       | 65398            | NR               | 660       | 49763            | NR               | 790       | 2581             | NR               | 920       | 3047             | NR               |
| 405       | 1761             | NR               | 535       | 69597            | NR               | 665       | 42891            | NR               | 795       | 2711             | NR               | 925       | 2256             | NR               |
| 410       | 2680             | NR               | 540       | 74214            | NR               | 670       | 36939            | NR               | 800       | 2609             | NR               | 930       | 2976             | NR               |
| 415       | 4374             | NR               | 545       | 79911            | NR               | 675       | 31946            | NR               | 805       | 2581             | NR               | 935       | 3503             | NR               |
| 420       | 8071             | NR               | 550       | 86153            | NR               | 680       | 27385            | NR               | 810       | 2404             | NR               | 940       | 4226             | NR               |
| 425       | 15169            | NR               | 555       | 93952            | NR               | 685       | 23504            | NR               | 815       | 2556             | NR               | 945       | 2930             | NR               |
| 430       | 26038            | NR               | 560       | 102904           | NR               | 690       | 20210            | NR               | 820       | 2742             | NR               | 950       | 2115             | NR               |
| 435       | 41316            | NR               | 565       | 112009           | NR               | 695       | 17459            | NR               | 825       | 2014             | NR               | 955       | 2634             | NR               |
| 440       | 59674            | NR               | 570       | 121662           | NR               | 700       | 15207            | NR               | 830       | 2488             | NR               | 960       | 4200             | NR               |
| 445       | 72751            | NR               | 575       | 130476           | NR               | 705       | 13322            | NR               | 835       | 2625             | NR               | 965       | 1982             | NR               |
| 450       | 65091            | NR               | 580       | 137926           | NR               | 710       | 11676            | NR               | 840       | 2754             | NR               | 970       | 3613             | NR               |
| 455       | 44894            | NR               | 585       | 143406           | NR               | 715       | 10626            | NR               | 845       | 2708             | NR               | 975       | 4034             | NR               |
| 460       | 32712            | NR               | 590       | 147039           | NR               | 720       | 9416             | NR               | 850       | 2608             | NR               | 980       | 3922             | NR               |
| 465       | 25296            | NR               | 595       | 147365           | NR               | 725       | 8333             | NR               | 855       | 2605             | NR               | 985       | 1909             | NR               |
| 470       | 19318            | NR               | 600       | 145800           | NR               | 730       | 7134             | NR               | 860       | 1765             | NR               | 990       | 3617             | NR               |
| 475       | 17265            | NR               | 605       | 141363           | NR               | 735       | 6437             | NR               | 865       | 2581             | NR               | 995       | 4767             | NR               |
| 480       | 18260            | NR               | 610       | 134199           | NR               | 740       | 5834             | NR               | 870       | 3016             | NR               | 1000      | 2528             | NR               |
| 485       | 20845            | NR               | 615       | 127683           | NR               | 745       | 5500             | NR               | 875       | 3952             | NR               |           |                  |                  |

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**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: 3101.5**

**M/P: 0.45**

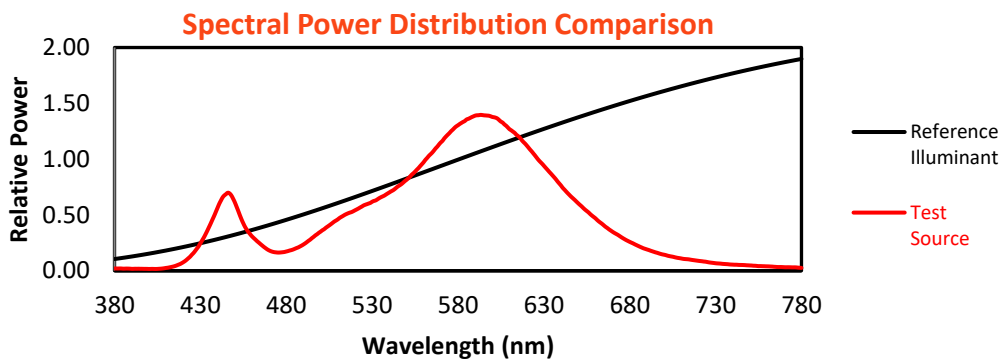
| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 2397             | NR               | 490       | 24908            | NR               | 620       | 118784           | NR               | 750       | 5037             | NR               | 880       | 2677             | NR               |
| 365       | 2084             | NR               | 495       | 30998            | NR               | 625       | 108951           | NR               | 755       | 4413             | NR               | 885       | 2940             | NR               |
| 370       | 2143             | NR               | 500       | 37103            | NR               | 630       | 99573            | NR               | 760       | 4189             | NR               | 890       | 3116             | NR               |
| 375       | 2413             | NR               | 505       | 42987            | NR               | 635       | 90444            | NR               | 765       | 3677             | NR               | 895       | 3345             | NR               |
| 380       | 2172             | NR               | 510       | 48702            | NR               | 640       | 80749            | NR               | 770       | 3366             | NR               | 900       | 2312             | NR               |
| 385       | 1997             | NR               | 515       | 53741            | NR               | 645       | 71664            | NR               | 775       | 3211             | NR               | 905       | 2829             | NR               |
| 390       | 1830             | NR               | 520       | 57283            | NR               | 650       | 63936            | NR               | 780       | 2682             | NR               | 910       | 2783             | NR               |
| 395       | 1861             | NR               | 525       | 61876            | NR               | 655       | 56611            | NR               | 785       | 2804             | NR               | 915       | 2662             | NR               |
| 400       | 1717             | NR               | 530       | 65398            | NR               | 660       | 49763            | NR               | 790       | 2581             | NR               | 920       | 3047             | NR               |
| 405       | 1761             | NR               | 535       | 69597            | NR               | 665       | 42891            | NR               | 795       | 2711             | NR               | 925       | 2256             | NR               |
| 410       | 2680             | NR               | 540       | 74214            | NR               | 670       | 36939            | NR               | 800       | 2609             | NR               | 930       | 2976             | NR               |
| 415       | 4374             | NR               | 545       | 79911            | NR               | 675       | 31946            | NR               | 805       | 2581             | NR               | 935       | 3503             | NR               |
| 420       | 8071             | NR               | 550       | 86153            | NR               | 680       | 27385            | NR               | 810       | 2404             | NR               | 940       | 4226             | NR               |
| 425       | 15169            | NR               | 555       | 93952            | NR               | 685       | 23504            | NR               | 815       | 2556             | NR               | 945       | 2930             | NR               |
| 430       | 26038            | NR               | 560       | 102904           | NR               | 690       | 20210            | NR               | 820       | 2742             | NR               | 950       | 2115             | NR               |
| 435       | 41316            | NR               | 565       | 112009           | NR               | 695       | 17459            | NR               | 825       | 2014             | NR               | 955       | 2634             | NR               |
| 440       | 59674            | NR               | 570       | 121662           | NR               | 700       | 15207            | NR               | 830       | 2488             | NR               | 960       | 4200             | NR               |
| 445       | 72751            | NR               | 575       | 130476           | NR               | 705       | 13322            | NR               | 835       | 2625             | NR               | 965       | 1982             | NR               |
| 450       | 65091            | NR               | 580       | 137926           | NR               | 710       | 11676            | NR               | 840       | 2754             | NR               | 970       | 3613             | NR               |
| 455       | 44894            | NR               | 585       | 143406           | NR               | 715       | 10626            | NR               | 845       | 2708             | NR               | 975       | 4034             | NR               |
| 460       | 32712            | NR               | 590       | 147039           | NR               | 720       | 9416             | NR               | 850       | 2608             | NR               | 980       | 3922             | NR               |
| 465       | 25296            | NR               | 595       | 147365           | NR               | 725       | 8333             | NR               | 855       | 2605             | NR               | 985       | 1909             | NR               |
| 470       | 19318            | NR               | 600       | 145800           | NR               | 730       | 7134             | NR               | 860       | 1765             | NR               | 990       | 3617             | NR               |
| 475       | 17265            | NR               | 605       | 141363           | NR               | 735       | 6437             | NR               | 865       | 2581             | NR               | 995       | 4767             | NR               |
| 480       | 18260            | NR               | 610       | 134199           | NR               | 740       | 5834             | NR               | 870       | 3016             | NR               | 1000      | 2528             | NR               |
| 485       | 20845            | NR               | 615       | 127683           | NR               | 745       | 5500             | NR               | 875       | 3952             | NR               |           |                  |                  |

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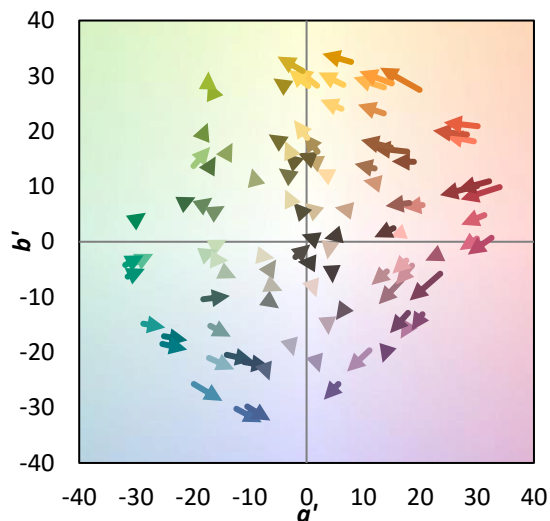
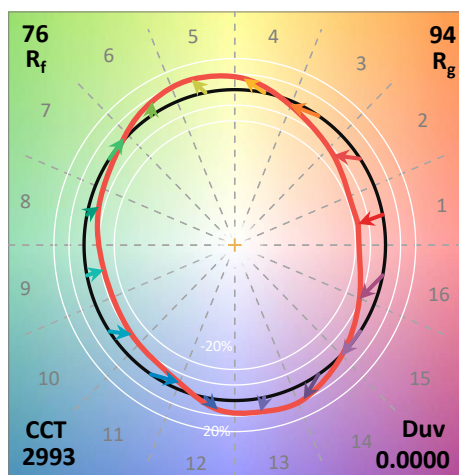
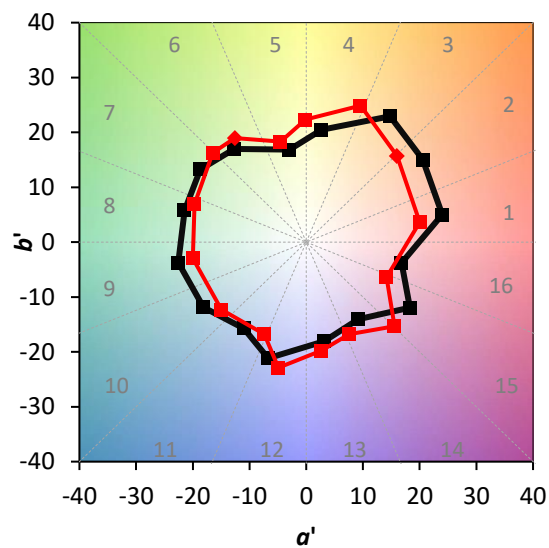
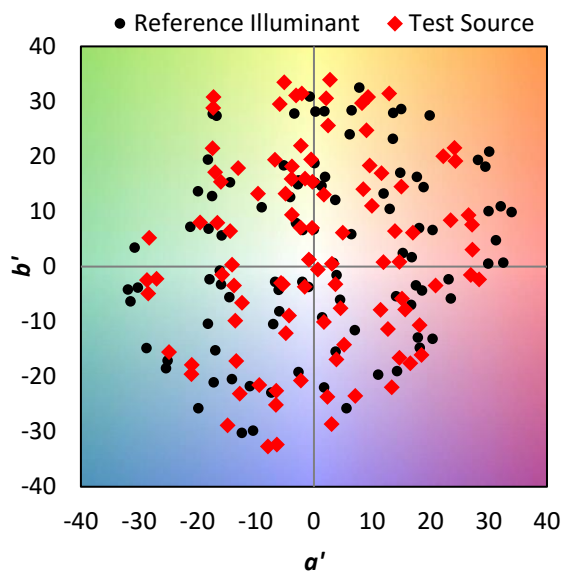
**TM-30-18**

**Summary**

$R_f = 75.7$   
 $R_g = 93.9$   
 CIE  $R_a = 71.8$   
 $R_g = -38.3$



**Color Vector Graphics**



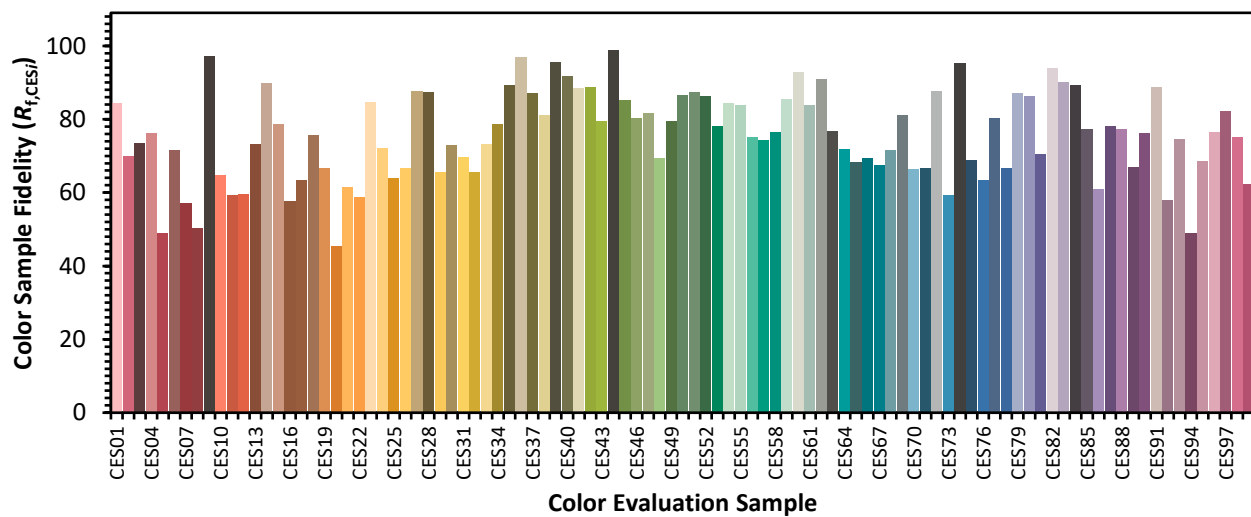


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**Individual Sample Fidelity Index ( $R_{f,i}$ )**

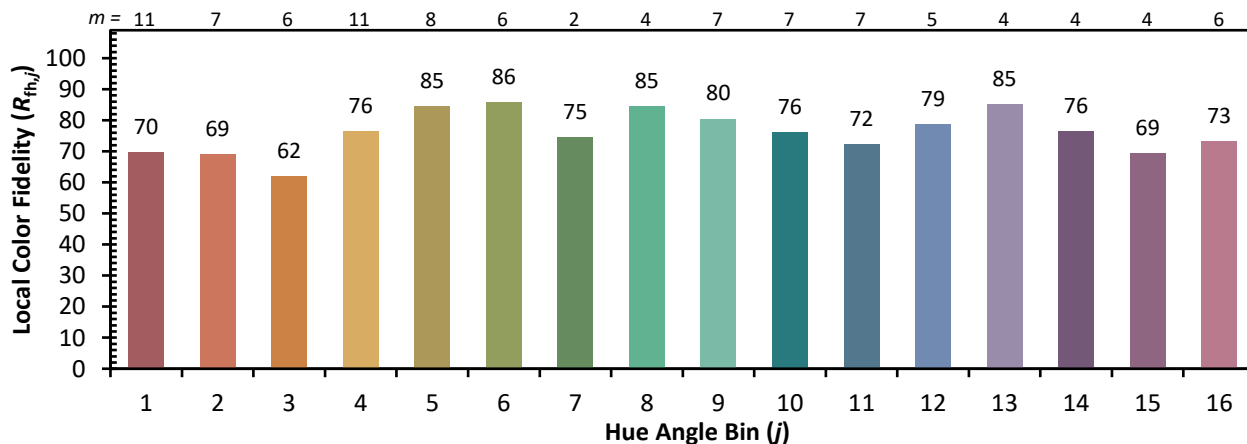
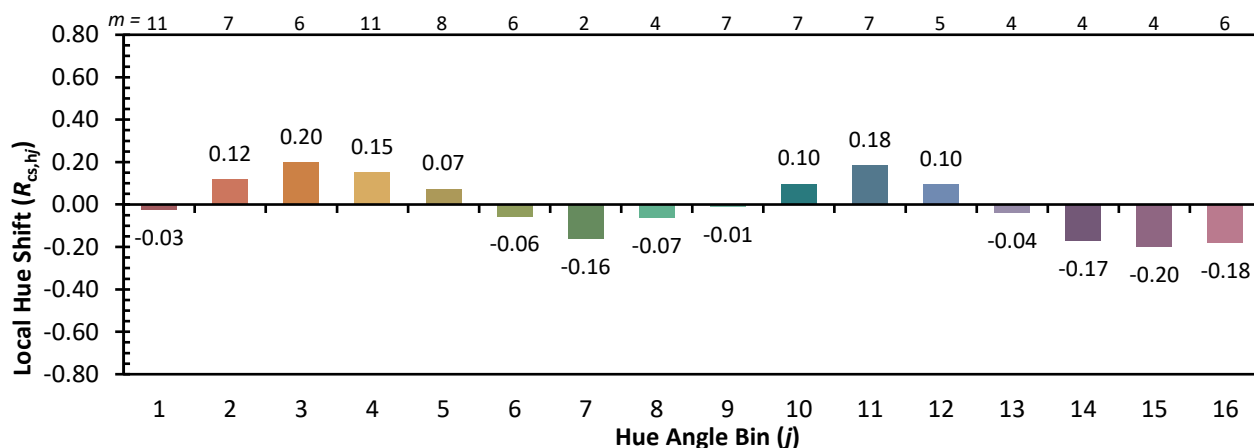
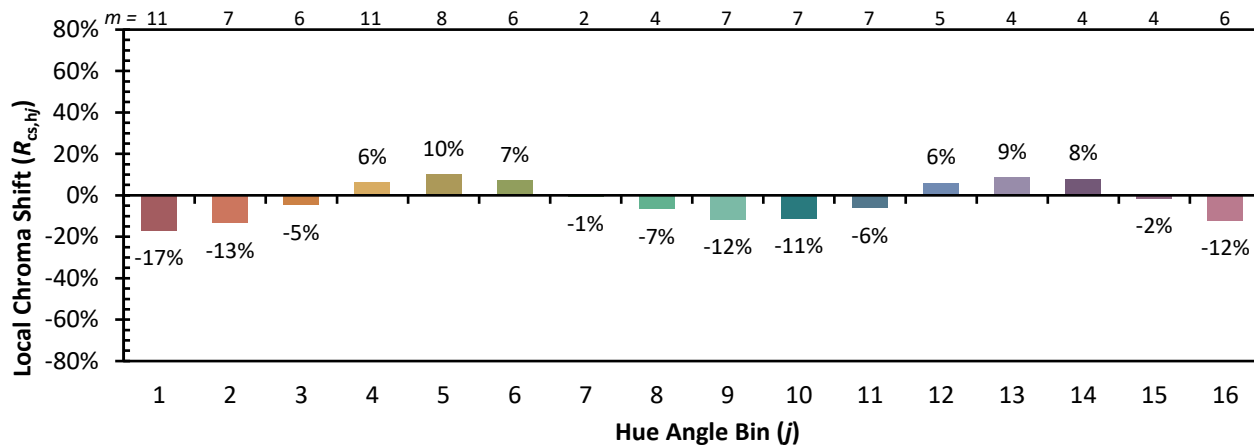
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 67 | CES51 = 87 | CES76 = 63 |
| CES02 = 63 | CES27 = 88 | CES52 = 86 | CES77 = 80 |
| CES03 = 31 | CES28 = 87 | CES53 = 78 | CES78 = 67 |
| CES04 = 71 | CES29 = 66 | CES54 = 84 | CES79 = 87 |
| CES05 = 49 | CES30 = 73 | CES55 = 84 | CES80 = 86 |
| CES06 = 51 | CES31 = 70 | CES56 = 75 | CES81 = 71 |
| CES07 = 41 | CES32 = 65 | CES57 = 74 | CES82 = 94 |
| CES08 = 40 | CES33 = 73 | CES58 = 76 | CES83 = 90 |
| CES09 = 29 | CES34 = 79 | CES59 = 85 | CES84 = 89 |
| CES10 = 76 | CES35 = 89 | CES60 = 93 | CES85 = 77 |
| CES11 = 59 | CES36 = 97 | CES61 = 84 | CES86 = 61 |
| CES12 = 65 | CES37 = 87 | CES62 = 91 | CES87 = 78 |
| CES13 = 43 | CES38 = 81 | CES63 = 77 | CES88 = 77 |
| CES14 = 74 | CES39 = 95 | CES64 = 72 | CES89 = 67 |
| CES15 = 71 | CES40 = 92 | CES65 = 68 | CES90 = 76 |
| CES16 = 47 | CES41 = 88 | CES66 = 69 | CES91 = 89 |
| CES17 = 50 | CES42 = 89 | CES67 = 67 | CES92 = 58 |
| CES18 = 56 | CES43 = 79 | CES68 = 72 | CES93 = 74 |
| CES19 = 73 | CES44 = 99 | CES69 = 81 | CES94 = 49 |
| CES20 = 66 | CES45 = 85 | CES70 = 66 | CES95 = 68 |
| CES21 = 87 | CES46 = 80 | CES71 = 67 | CES96 = 76 |
| CES22 = 79 | CES47 = 82 | CES72 = 88 | CES97 = 82 |
| CES23 = 92 | CES48 = 69 | CES73 = 59 | CES98 = 75 |
| CES24 = 91 | CES49 = 80 | CES74 = 95 | CES99 = 62 |
| CES25 = 73 | CES50 = 87 | CES75 = 69 |            |



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**TM-30-18**

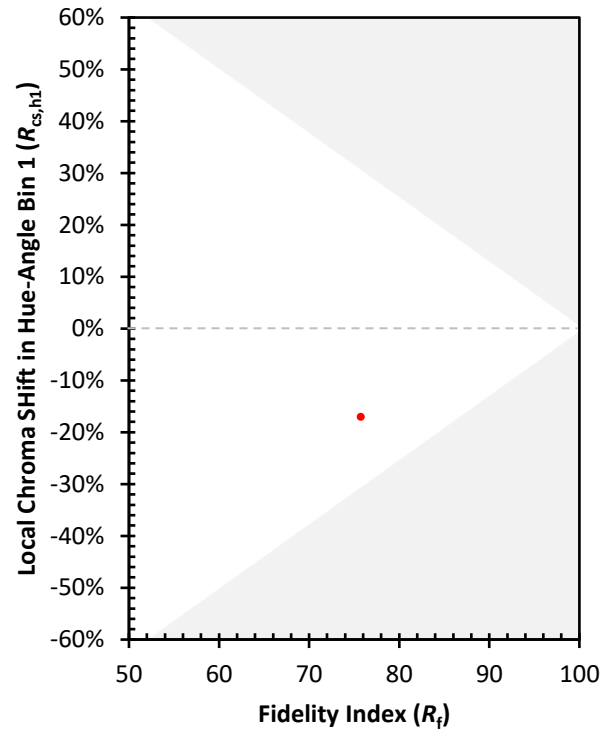
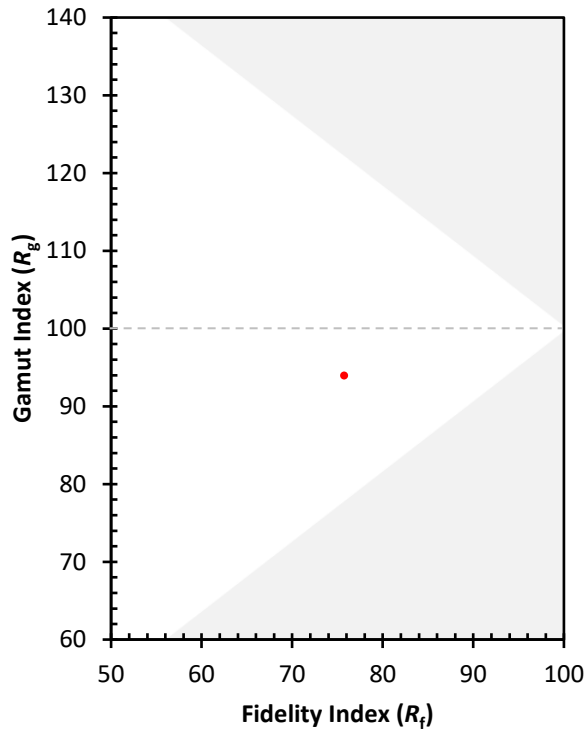
**Color Rendition by Hue-Angle Bin**



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**TM-30-18**

**Measure Comparisons**



(END OF REPORT)