

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

Test Report Prepared for  
Cooper Lighting Solutions  
(formerly Eaton)

Brand: McGRAW-EDISON

Report Number: P319955

Luminaire Tested: **GLEON-SA1B-730-U-SL4**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P319955  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-24)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA1B-730-U-SL4  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(1) 70 CRI, 3000K, 800mA LIGHTSQUARE WITH 16 LEDS AND TYPE IV SPILL LIGHT  
ELIMINATOR OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 5177 lumens  
Efficiency: N/A  
Efficacy: 117.7 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 0.5' x H: 0')  
IES Classification: Type IV - Short  
BUG Rating: B1 - U0 - G2

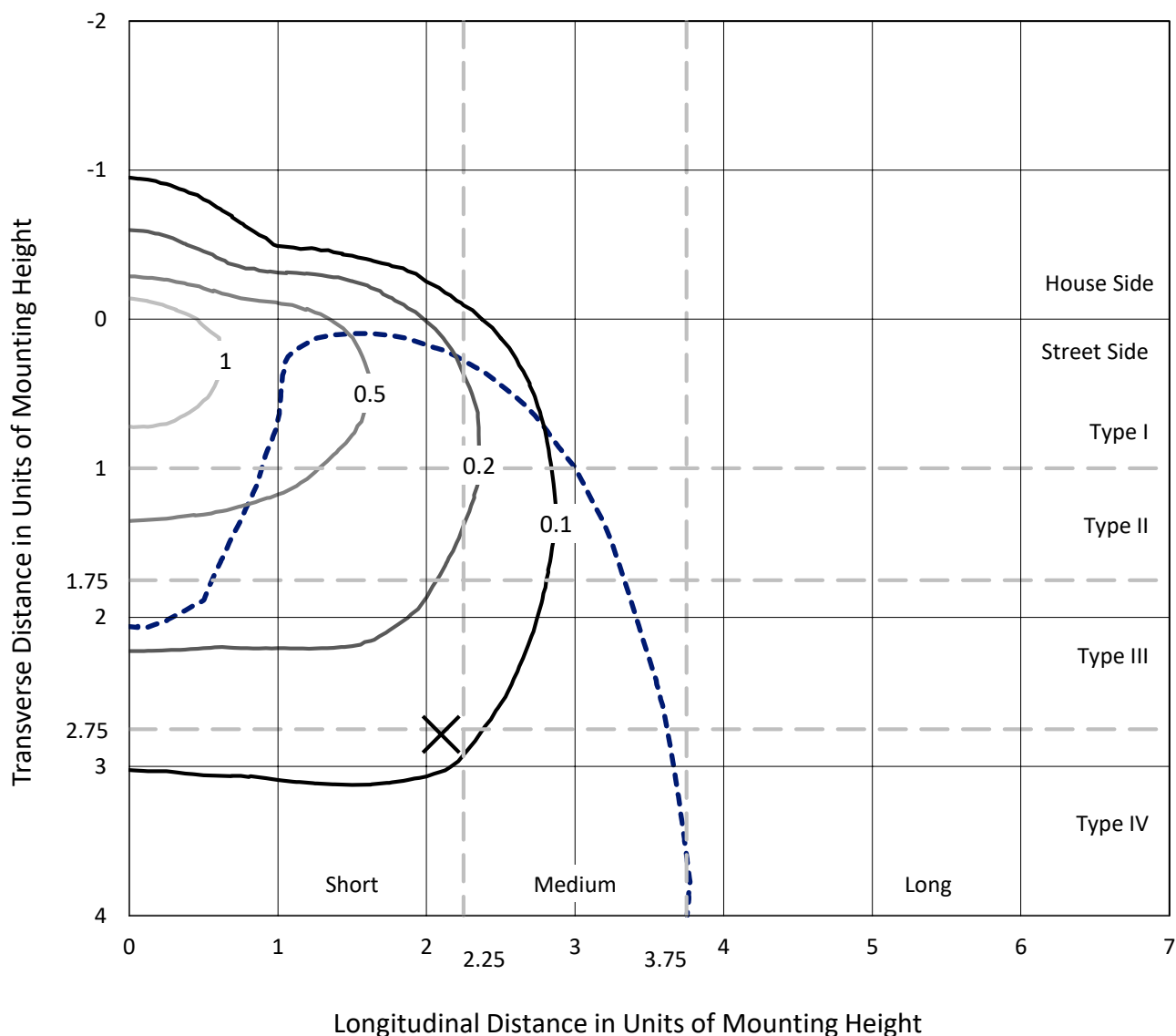
Input Watts (W): 44  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



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## Iso-Footcandle Lines of Horizontal Illumination

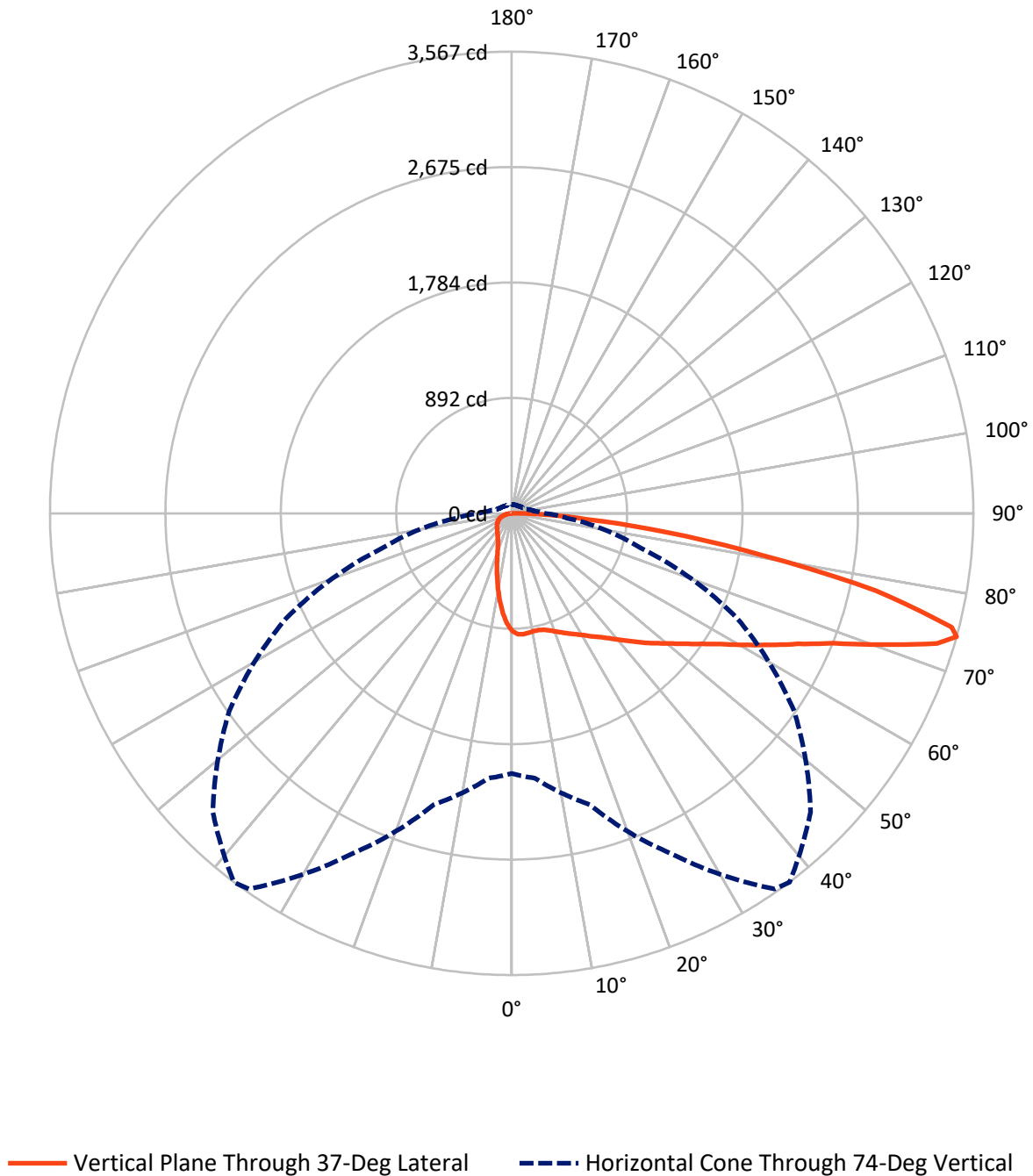
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 1.5 fc  
 Type IV - Short - N/A

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## Luminous Intensity Polar Plot



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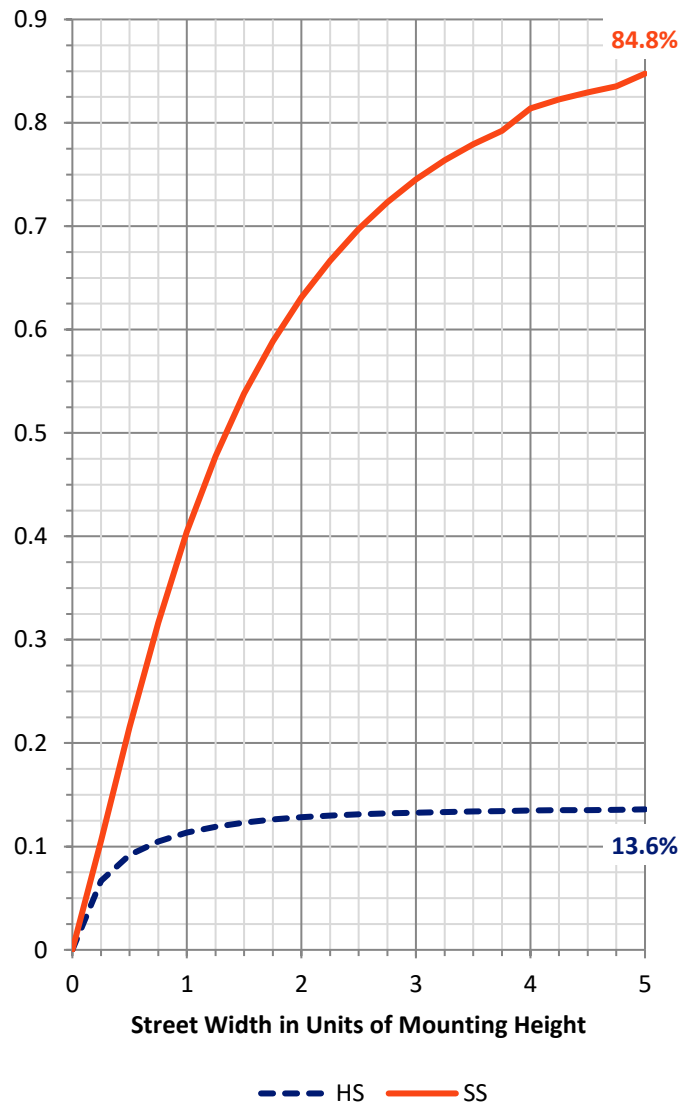
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 712.3    | 0.0    | 712.3  |
|                    | % Fixture | 13.8     | 0.0    | 13.8   |
| <b>Street Side</b> | Lumens    | 4464.7   | 0.0    | 4464.7 |
|                    | % Fixture | 86.2     | 0.0    | 86.2   |
| <b>Total</b>       | Lumens    | 5177.0   | 0.0    | 5177.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 80.3   | 1.6       |
| 10°-20°   | 205.9  | 4.0       |
| 20°-30°   | 317.2  | 6.1       |
| 30°-40°   | 461.3  | 8.9       |
| 40°-50°   | 679.0  | 13.1      |
| 50°-60°   | 953.5  | 18.4      |
| 60°-70°   | 1206.9 | 23.3      |
| 70°-80°   | 1062.7 | 20.5      |
| 80°-90°   | 210.1  | 4.1       |
| 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°    | 5177.0 | 100.0     |
| 0°-180°   | 5177.0 | 100.0     |

**Coefficient of Utilization**



REPORT NUMBER: P319955

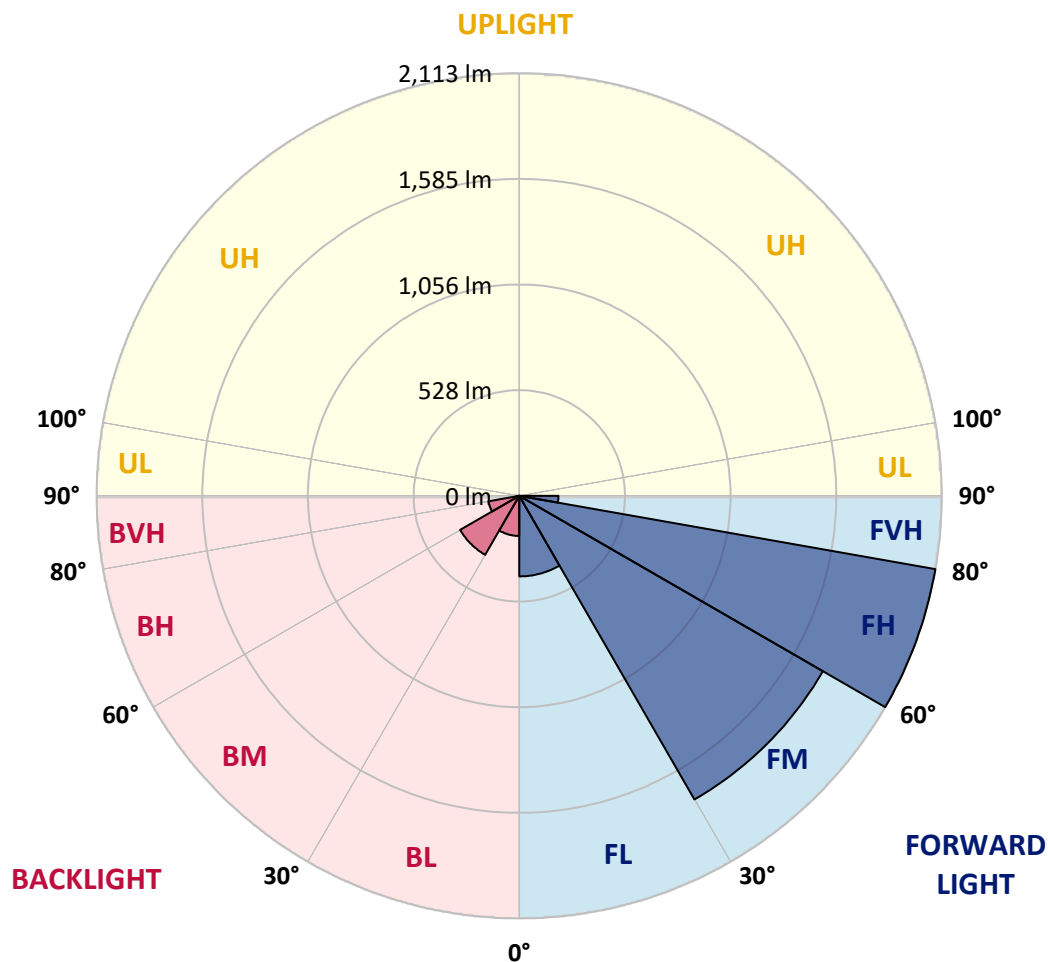
CATALOG NUMBER: GLEON-SA1B-730-U-SL4

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 402.8  | 7.8       |                         |      |         |
| FM   | (30°-60°)   | 1753.0 | 33.9      |                         |      |         |
| FH   | (60°-80°)   | 2113.0 | 40.8      |                         |      | G2/5000 |
| FVH  | (80°-90°)   | 195.9  | 3.8       |                         |      | G2/225  |
| BL   | (0°-30°)    | 200.6  | 3.9       | B1/500                  |      |         |
| BM   | (30°-60°)   | 340.9  | 6.6       | B1/1000                 |      |         |
| BH   | (60°-80°)   | 156.6  | 3.0       | B1/500                  |      | G1/500  |
| BVH  | (80°-90°)   | 14.2   | 0.3       |                         |      | G1/100  |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

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

Type IV Short





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 37°    | 45°    | 55°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 912.2  | 912.2  | 912.2  | 912.2  | 912.2  | 912.2  | 912.2  | 912.2  | 912.2  | 912.2  | 912.2  |
| 2.5°  | 943.4  | 943.5  | 943.4  | 941.9  | 938.4  | 935.5  | 933.1  | 929.7  | 922.0  | 916.2  | 907.4  |
| 5°    | 952.3  | 951.2  | 950.5  | 947.7  | 942.3  | 939.0  | 934.4  | 927.9  | 915.3  | 903.6  | 889.4  |
| 7.5°  | 948.1  | 946.8  | 945.2  | 941.9  | 935.7  | 933.0  | 926.6  | 918.0  | 902.9  | 887.5  | 867.1  |
| 10°   | 935.1  | 934.8  | 934.1  | 933.3  | 928.0  | 925.8  | 920.0  | 910.9  | 895.9  | 877.3  | 853.4  |
| 12.5° | 920.7  | 921.7  | 924.6  | 928.4  | 926.0  | 924.9  | 921.3  | 915.1  | 899.8  | 879.7  | 850.9  |
| 15°   | 911.6  | 914.2  | 922.0  | 932.0  | 934.1  | 933.7  | 932.8  | 928.8  | 912.5  | 890.3  | 856.7  |
| 17.5° | 908.5  | 912.7  | 927.7  | 944.3  | 950.1  | 951.4  | 951.7  | 944.8  | 926.8  | 903.2  | 862.7  |
| 20°   | 914.2  | 919.5  | 941.3  | 964.1  | 973.4  | 974.2  | 972.5  | 960.5  | 940.3  | 914.4  | 866.0  |
| 22.5° | 931.3  | 936.1  | 963.4  | 989.1  | 999.7  | 1000.8 | 995.9  | 977.6  | 954.5  | 927.5  | 870.6  |
| 25°   | 964.3  | 970.2  | 997.5  | 1023.2 | 1028.7 | 1028.9 | 1021.8 | 999.2  | 973.1  | 945.9  | 880.4  |
| 27.5° | 1007.4 | 1013.2 | 1037.8 | 1063.0 | 1060.1 | 1058.4 | 1048.8 | 1026.1 | 997.3  | 971.3  | 897.9  |
| 30°   | 1055.3 | 1061.7 | 1085.0 | 1102.9 | 1096.0 | 1092.7 | 1084.9 | 1055.7 | 1031.1 | 1005.9 | 924.8  |
| 32.5° | 1104.9 | 1110.8 | 1131.2 | 1143.4 | 1134.6 | 1133.2 | 1121.3 | 1094.7 | 1075.0 | 1058.8 | 968.2  |
| 35°   | 1155.8 | 1160.0 | 1180.1 | 1187.0 | 1175.3 | 1174.9 | 1171.7 | 1147.2 | 1134.8 | 1142.5 | 1031.2 |
| 37.5° | 1207.8 | 1208.9 | 1226.0 | 1226.4 | 1222.9 | 1224.4 | 1227.8 | 1212.5 | 1216.0 | 1239.9 | 1113.3 |
| 40°   | 1254.1 | 1257.0 | 1269.4 | 1273.2 | 1279.3 | 1284.4 | 1301.7 | 1291.7 | 1318.5 | 1360.8 | 1215.4 |
| 42.5° | 1288.4 | 1294.0 | 1313.9 | 1323.8 | 1343.3 | 1351.3 | 1375.7 | 1385.0 | 1439.0 | 1502.5 | 1336.9 |
| 45°   | 1317.4 | 1326.1 | 1358.0 | 1378.3 | 1411.3 | 1425.3 | 1460.3 | 1491.5 | 1575.2 | 1656.2 | 1464.7 |
| 47.5° | 1348.7 | 1359.9 | 1399.8 | 1438.5 | 1483.3 | 1499.2 | 1562.8 | 1609.5 | 1720.6 | 1810.8 | 1585.3 |
| 50°   | 1394.9 | 1403.4 | 1442.5 | 1503.2 | 1559.2 | 1579.6 | 1667.7 | 1734.6 | 1868.3 | 1958.2 | 1689.8 |
| 52.5° | 1459.2 | 1456.0 | 1489.0 | 1574.1 | 1649.3 | 1674.4 | 1779.7 | 1867.7 | 2018.0 | 2091.5 | 1778.0 |
| 55°   | 1524.0 | 1518.5 | 1541.7 | 1648.4 | 1754.3 | 1780.8 | 1902.9 | 2001.4 | 2160.4 | 2211.5 | 1845.7 |
| 57.5° | 1596.0 | 1585.6 | 1605.1 | 1732.1 | 1873.9 | 1905.5 | 2041.0 | 2143.5 | 2300.5 | 2308.5 | 1888.7 |
| 60°   | 1670.2 | 1656.2 | 1678.1 | 1835.8 | 2025.8 | 2063.0 | 2202.6 | 2282.1 | 2432.5 | 2386.2 | 1902.6 |
| 62.5° | 1735.2 | 1725.3 | 1759.0 | 1951.6 | 2197.1 | 2237.9 | 2361.2 | 2429.4 | 2562.7 | 2418.5 | 1852.6 |
| 65°   | 1791.9 | 1793.5 | 1851.9 | 2081.8 | 2388.0 | 2431.6 | 2543.2 | 2611.0 | 2665.2 | 2399.3 | 1735.7 |
| 67.5° | 1859.5 | 1868.8 | 1968.4 | 2253.2 | 2628.4 | 2676.1 | 2808.0 | 2809.1 | 2722.5 | 2287.0 | 1505.6 |
| 70°   | 1958.2 | 1977.3 | 2128.7 | 2491.0 | 2970.1 | 3035.8 | 3137.5 | 2925.4 | 2642.0 | 1982.4 | 1184.6 |
| 72.5° | 2045.7 | 2081.5 | 2299.2 | 2763.1 | 3386.6 | 3436.4 | 3330.3 | 2858.3 | 2305.9 | 1485.7 | 738.0  |
| 74°   | 2010.2 | 2054.5 | 2330.2 | 2897.2 | 3543.4 | 3567.3 | 3265.2 | 2662.5 | 1922.6 | 1028.9 | 428.9  |
| 75°   | 1933.6 | 1981.7 | 2285.0 | 2895.9 | 3523.6 | 3510.3 | 3108.0 | 2438.7 | 1583.4 | 701.7  | 285.4  |
| 77.5° | 1560.5 | 1611.3 | 1925.4 | 2481.9 | 2889.1 | 2876.6 | 2387.5 | 1636.0 | 693.5  | 230.1  | 145.0  |
| 80°   | 907.2  | 946.1  | 1195.2 | 1576.1 | 1948.2 | 1971.0 | 1570.1 | 809.5  | 272.8  | 129.3  | 98.3   |
| 82.5° | 403.0  | 429.8  | 577.4  | 804.6  | 1175.7 | 1205.0 | 822.3  | 424.2  | 168.5  | 78.6   | 59.1   |
| 85°   | 264.4  | 284.3  | 350.5  | 383.1  | 559.8  | 579.9  | 402.5  | 330.3  | 111.2  | 43.2   | 43.4   |
| 87.5° | 190.2  | 209.3  | 260.4  | 227.4  | 256.9  | 243.3  | 219.0  | 305.6  | 44.7   | 24.6   | 14.6   |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

REPORT NUMBER: P319955

CATALOG NUMBER: GLEON-SA1B-730-U-SL4

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 912.2  | 912.2  | 912.2 | 912.2 | 912.2 | 912.2 | 912.2 | 912.2 | 912.2 | 912.2 | 912.2 |
| 2.5°  | 903.6  | 900.7  | 894.1 | 881.7 | 874.8 | 868.9 | 859.3 | 853.6 | 851.1 | 850.9 | 852.0 |
| 5°    | 881.2  | 874.4  | 857.5 | 836.7 | 820.1 | 804.9 | 786.2 | 774.8 | 766.8 | 762.1 | 763.4 |
| 7.5°  | 855.1  | 844.5  | 817.9 | 784.7 | 758.1 | 728.7 | 699.7 | 682.4 | 668.9 | 658.9 | 660.7 |
| 10°   | 837.2  | 822.6  | 783.8 | 736.0 | 691.7 | 649.0 | 609.1 | 585.2 | 566.2 | 551.6 | 552.7 |
| 12.5° | 831.2  | 811.5  | 757.7 | 693.9 | 631.7 | 573.3 | 521.2 | 484.5 | 465.0 | 448.4 | 449.7 |
| 15°   | 832.1  | 805.7  | 735.8 | 656.0 | 577.7 | 504.2 | 440.9 | 398.1 | 371.7 | 360.2 | 360.3 |
| 17.5° | 832.8  | 798.9  | 712.8 | 615.3 | 524.3 | 439.7 | 370.9 | 327.5 | 302.5 | 292.0 | 292.1 |
| 20°   | 830.5  | 788.0  | 684.4 | 568.6 | 468.5 | 380.4 | 313.8 | 277.0 | 258.0 | 249.8 | 249.8 |
| 22.5° | 827.4  | 775.0  | 652.3 | 521.7 | 413.4 | 329.0 | 273.0 | 244.9 | 234.0 | 228.5 | 228.3 |
| 25°   | 828.8  | 765.4  | 619.5 | 473.6 | 362.7 | 287.9 | 245.8 | 227.2 | 219.9 | 216.5 | 216.3 |
| 27.5° | 836.7  | 760.8  | 589.2 | 425.6 | 318.4 | 257.1 | 227.6 | 214.5 | 209.7 | 207.5 | 207.5 |
| 30°   | 850.9  | 760.8  | 557.7 | 384.8 | 281.6 | 234.3 | 213.5 | 204.6 | 201.3 | 199.9 | 199.9 |
| 32.5° | 875.7  | 765.0  | 527.2 | 344.3 | 252.2 | 216.5 | 201.9 | 195.9 | 193.3 | 192.6 | 192.6 |
| 35°   | 918.4  | 779.2  | 497.5 | 306.0 | 228.5 | 201.9 | 190.7 | 187.3 | 185.5 | 185.3 | 185.8 |
| 37.5° | 978.4  | 808.2  | 469.6 | 277.7 | 211.7 | 190.0 | 181.4 | 178.7 | 177.6 | 178.5 | 179.3 |
| 40°   | 1053.9 | 847.6  | 444.2 | 252.2 | 199.0 | 180.5 | 172.9 | 171.1 | 170.5 | 171.8 | 172.9 |
| 42.5° | 1145.0 | 900.9  | 423.4 | 233.8 | 189.1 | 172.5 | 165.6 | 163.4 | 162.8 | 164.3 | 165.8 |
| 45°   | 1243.7 | 958.1  | 408.9 | 220.1 | 181.4 | 166.5 | 159.2 | 156.8 | 155.7 | 156.5 | 158.1 |
| 47.5° | 1333.4 | 1012.3 | 403.0 | 210.4 | 174.2 | 161.4 | 153.5 | 150.6 | 148.8 | 148.4 | 149.7 |
| 50°   | 1409.1 | 1052.6 | 405.8 | 204.6 | 168.3 | 155.7 | 148.1 | 144.8 | 142.1 | 140.4 | 141.3 |
| 52.5° | 1464.2 | 1077.9 | 408.3 | 202.1 | 163.8 | 149.5 | 142.1 | 139.0 | 135.3 | 132.6 | 132.6 |
| 55°   | 1504.1 | 1083.8 | 402.7 | 200.0 | 160.3 | 142.8 | 135.3 | 132.4 | 128.7 | 125.6 | 125.3 |
| 57.5° | 1519.8 | 1067.4 | 381.7 | 197.1 | 157.9 | 136.4 | 128.2 | 126.0 | 122.9 | 119.3 | 119.1 |
| 60°   | 1498.6 | 1016.7 | 341.2 | 190.9 | 154.8 | 131.1 | 121.1 | 119.6 | 118.2 | 114.7 | 114.5 |
| 62.5° | 1413.7 | 905.4  | 288.9 | 178.3 | 148.6 | 125.5 | 114.5 | 115.3 | 115.4 | 113.1 | 112.7 |
| 65°   | 1259.6 | 752.6  | 237.8 | 161.9 | 139.3 | 118.7 | 107.8 | 111.2 | 113.2 | 112.9 | 112.3 |
| 67.5° | 1035.6 | 585.7  | 201.5 | 144.6 | 127.1 | 109.4 | 100.5 | 104.5 | 106.1 | 107.4 | 107.0 |
| 70°   | 768.6  | 413.0  | 166.7 | 126.4 | 112.3 | 98.5  | 91.0  | 93.0  | 91.9  | 93.4  | 93.9  |
| 72.5° | 428.5  | 247.8  | 135.9 | 108.1 | 97.0  | 85.7  | 80.4  | 80.1  | 77.7  | 77.7  | 77.7  |
| 74°   | 257.1  | 181.8  | 119.4 | 96.8  | 87.7  | 77.3  | 72.8  | 71.1  | 68.9  | 69.1  | 68.9  |
| 75°   | 206.8  | 156.3  | 109.6 | 89.4  | 81.2  | 72.4  | 67.8  | 65.6  | 64.0  | 64.0  | 63.8  |
| 77.5° | 130.6  | 118.7  | 88.3  | 71.1  | 64.9  | 59.6  | 56.5  | 53.6  | 53.6  | 53.4  | 53.2  |
| 80°   | 98.7   | 94.5   | 68.7  | 53.8  | 49.8  | 45.8  | 43.8  | 42.5  | 42.5  | 43.0  | 42.9  |
| 82.5° | 67.7   | 71.1   | 48.3  | 37.6  | 35.6  | 32.6  | 32.3  | 32.5  | 31.9  | 31.2  | 31.0  |
| 85°   | 49.4   | 53.4   | 32.6  | 23.7  | 21.7  | 19.9  | 21.3  | 22.1  | 21.2  | 19.5  | 18.8  |
| 87.5° | 19.0   | 35.0   | 17.5  | 9.8   | 9.1   | 7.8   | 9.1   | 9.5   | 10.2  | 8.0   | 8.2   |
| 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 .

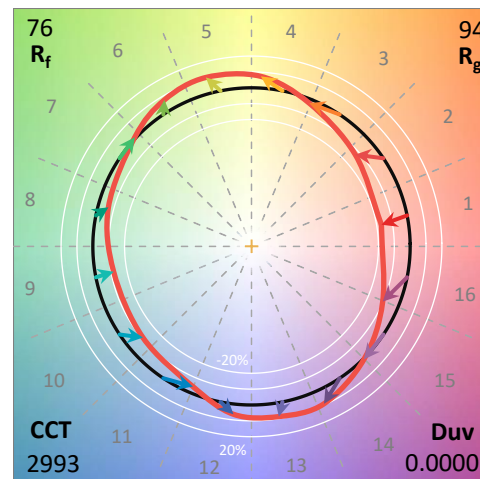
### Test Information

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

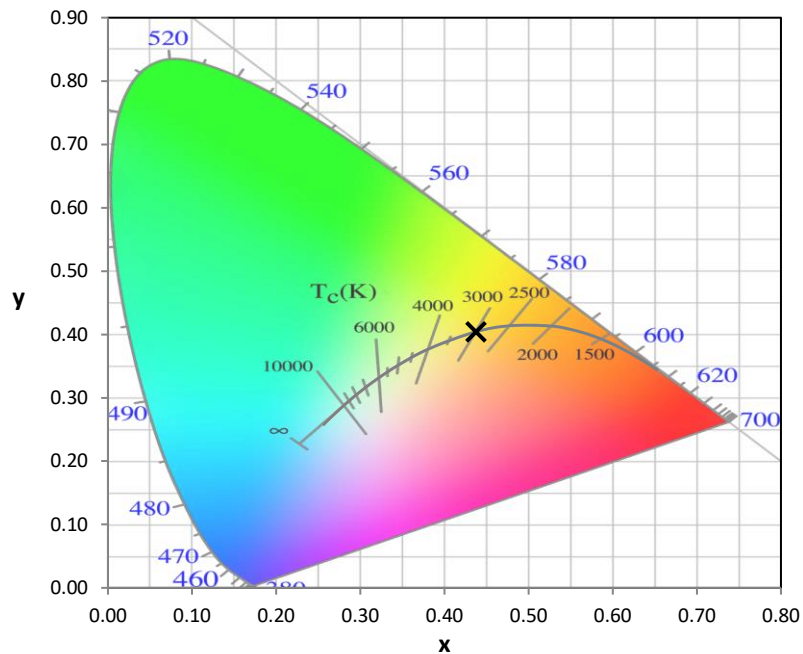
Stabilization Time: 53M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 25.0./44%  
 Sphere Temperature (°C): 25.7

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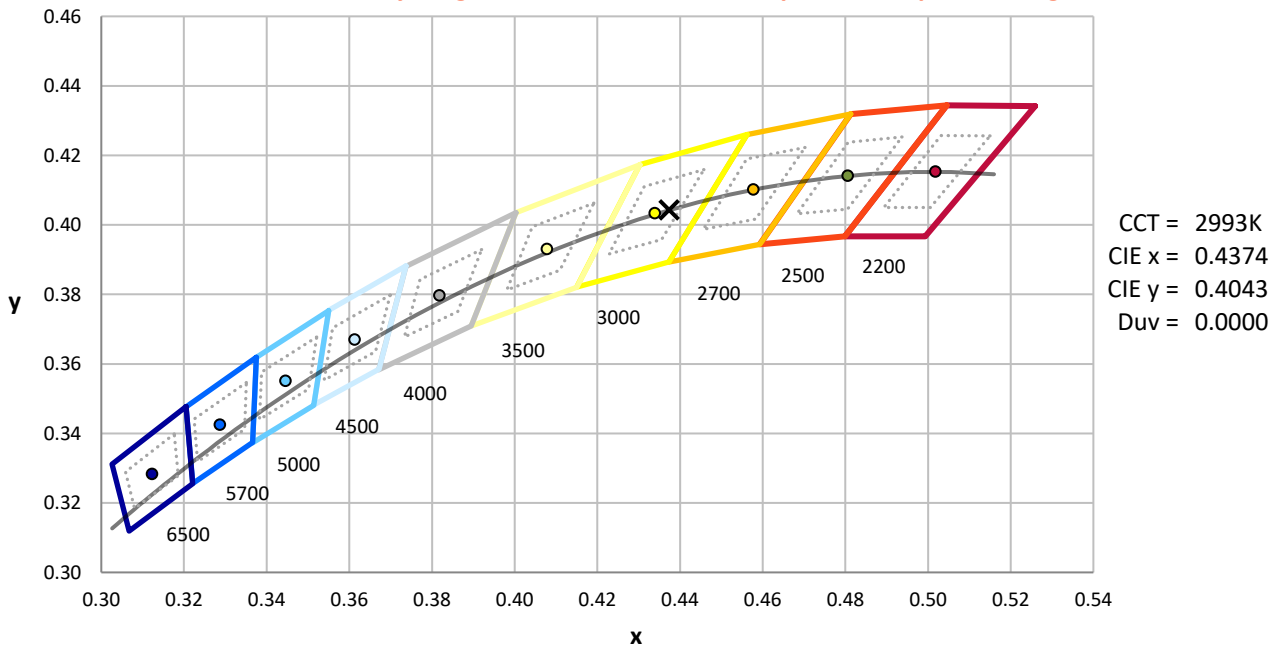
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date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



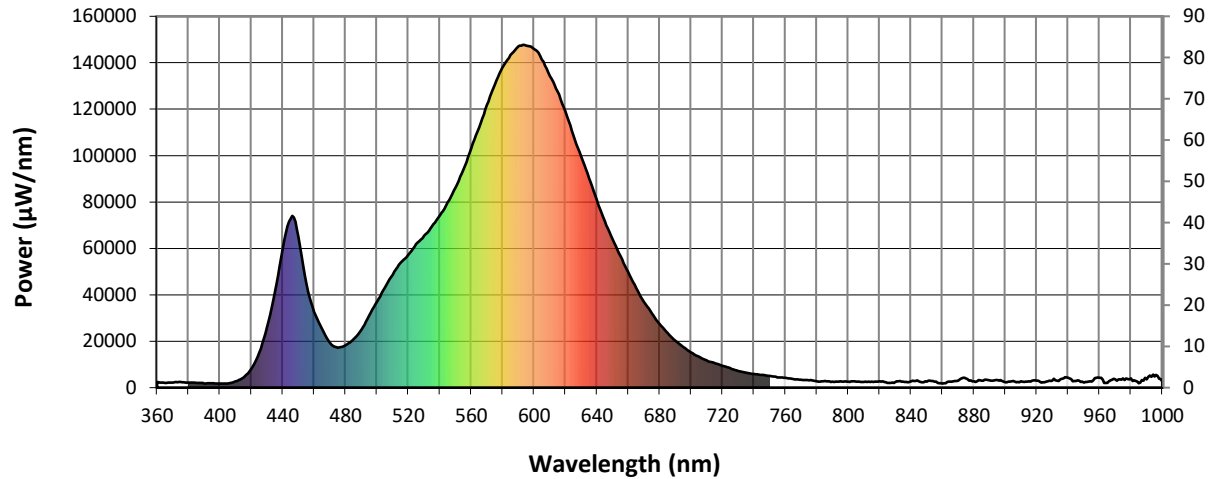
**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 3000K 4-step quadrangle

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**Photopic Flux vs. Wavelength**

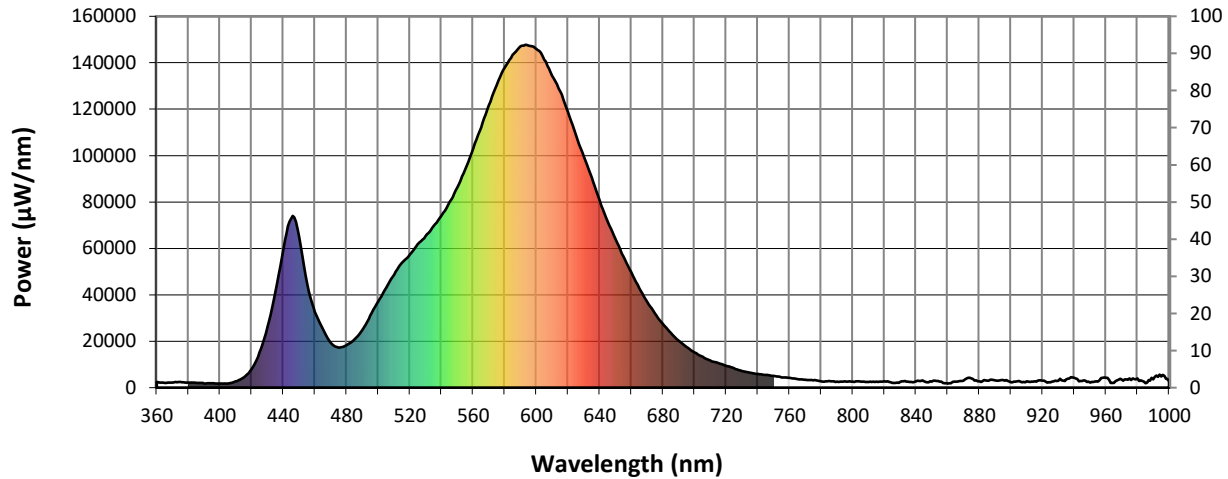


#####

| 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**



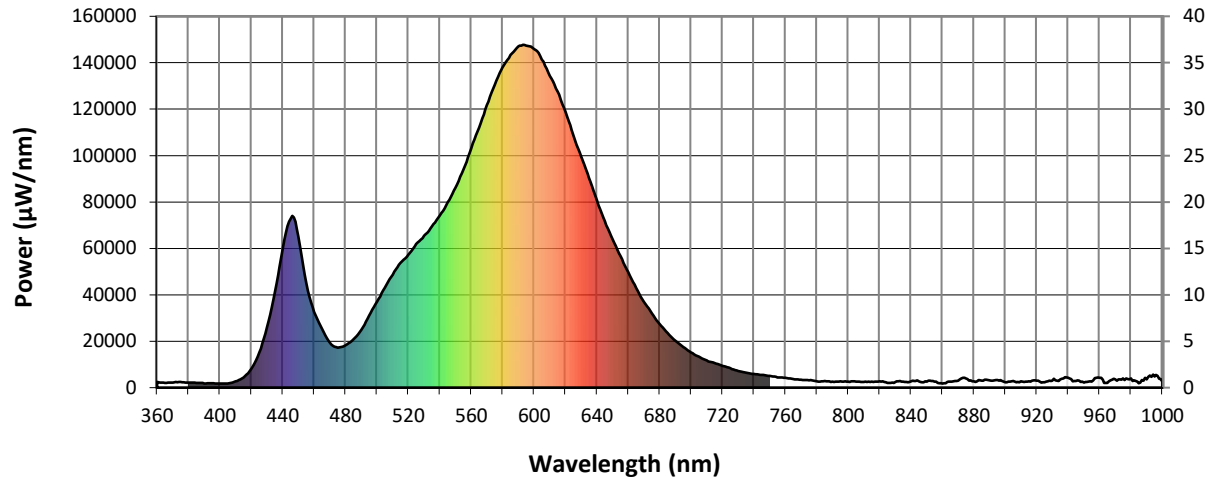
**Scotopic Lumens: 8494.8**

**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**

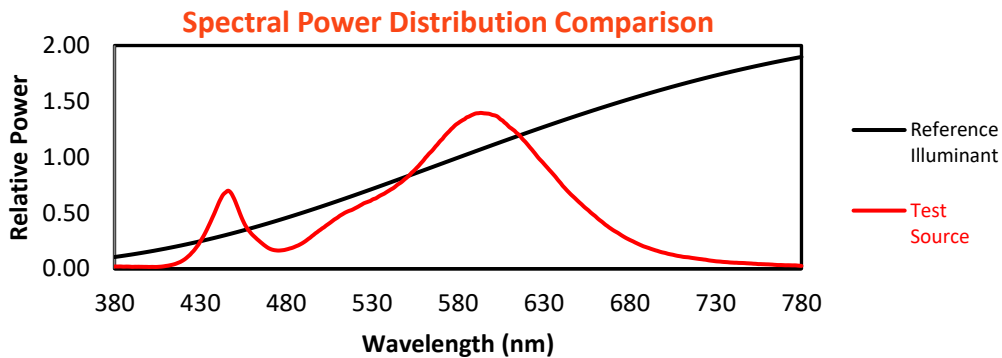
| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------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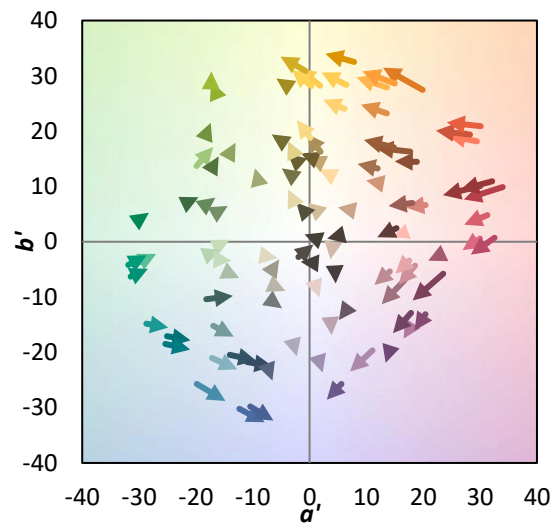
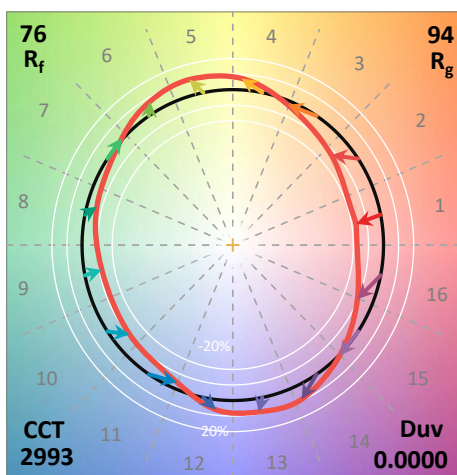
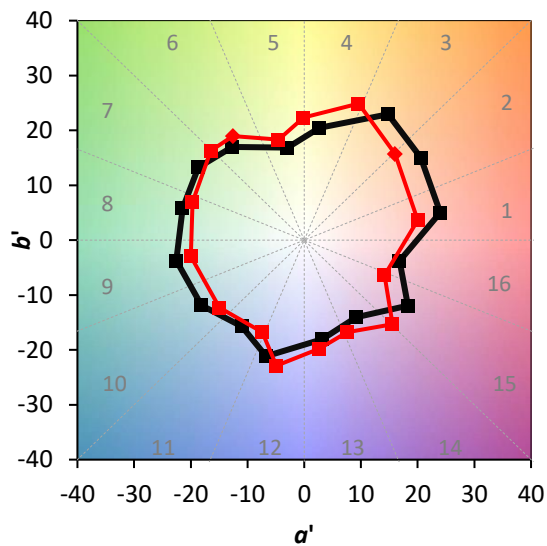
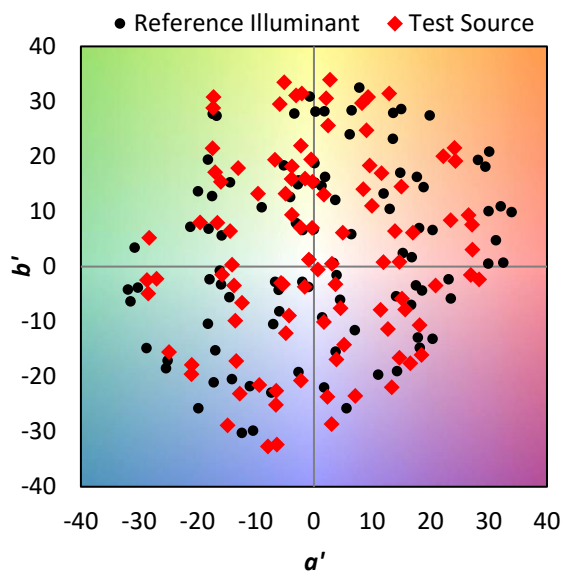
**TM-30-18**

**Summary**

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



**Color Vector Graphics**

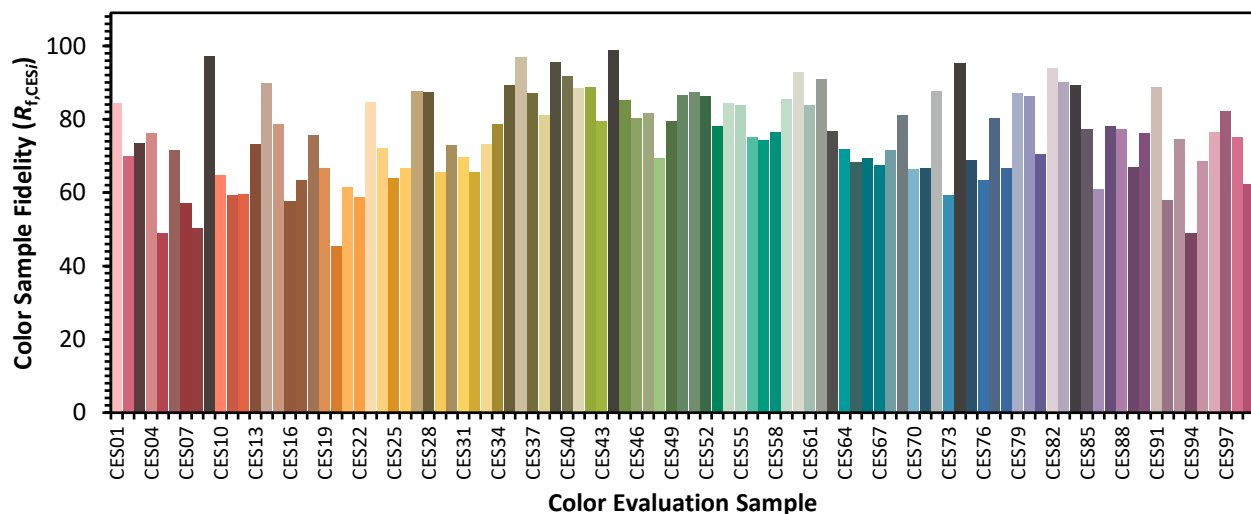


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**Individual Sample Fidelity Index ( $R_{f,i}$ )**

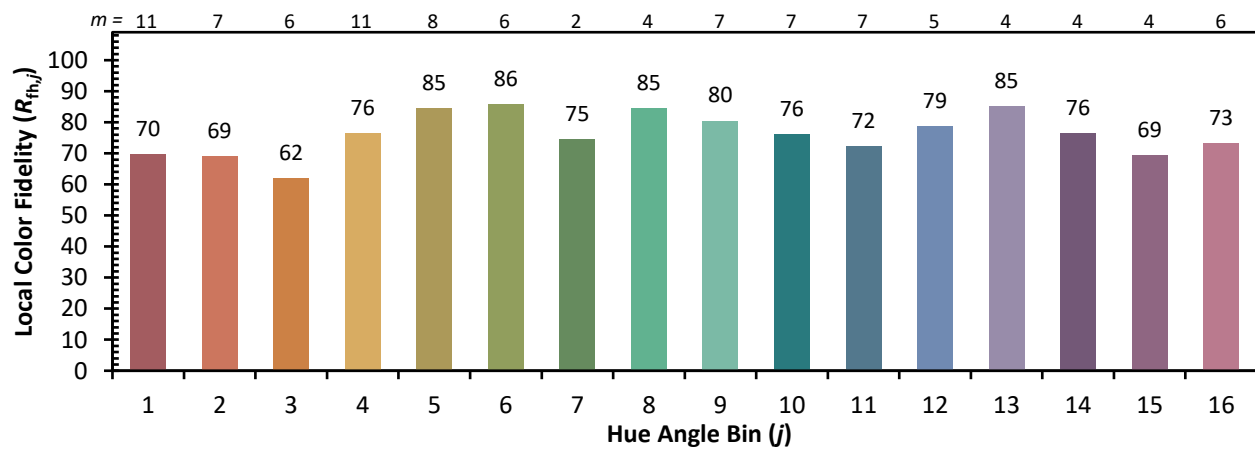
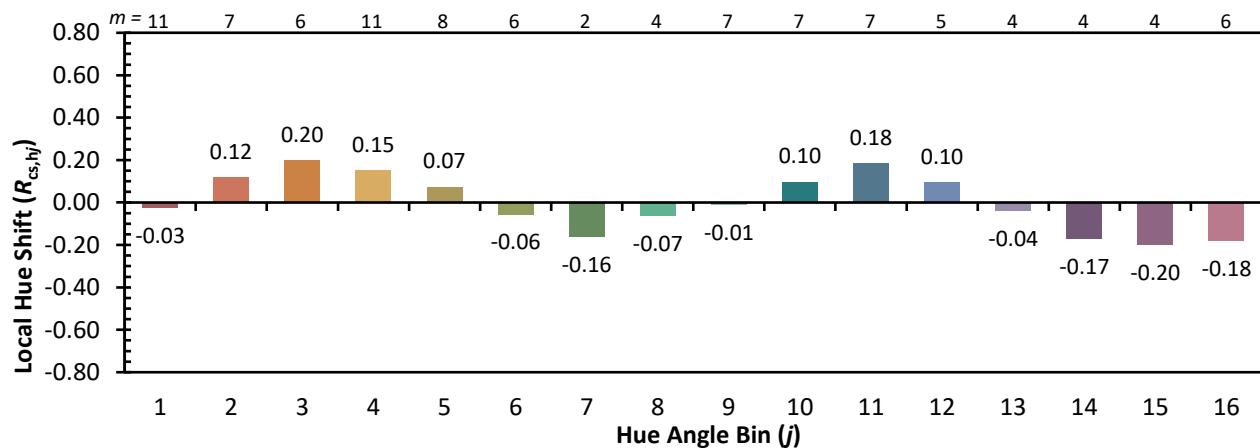
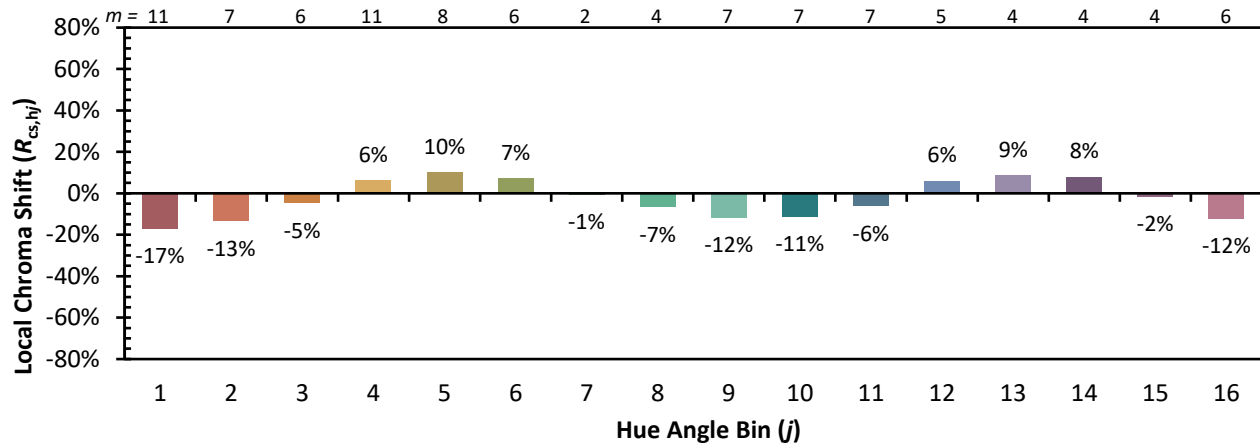
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|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 67 | CES51 = 87 | CES76 = 63 |
| CES02 = 63 | CES27 = 88 | CES52 = 86 | CES77 = 80 |
| CES03 = 31 | CES28 = 87 | CES53 = 78 | CES78 = 67 |
| CES04 = 71 | CES29 = 66 | CES54 = 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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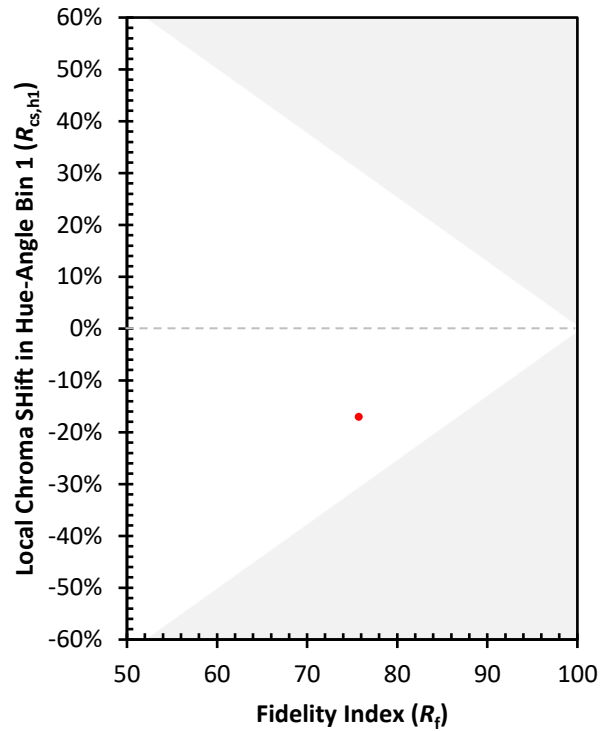
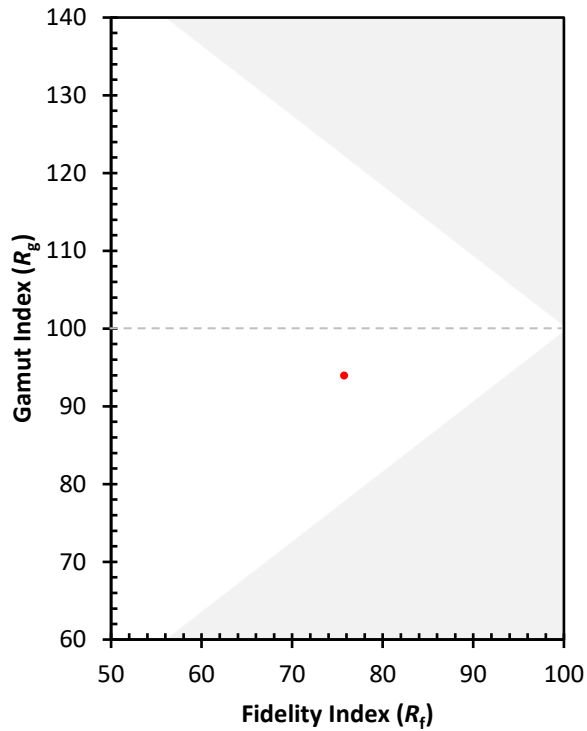
**Color Rendition by Hue-Angle Bin**



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**Measure Comparisons**



(END OF REPORT)