

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: P322756

Luminaire Tested: **GLEON-SA2B-722-U-T4FT-HSS**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P322756  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-17)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA2B-722-U-T4FT-HSS  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(2) 70 CRI, 2200K, 800mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE IV  
FORWARD THROW OPTICS WITH HOUSE SIDE SHIELD  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 6104 lumens  
Efficiency: N/A  
Efficacy: 71.8 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 1' x H: 0')  
IES Classification: Type IV - Short  
BUG Rating: B1 - U0 - G2

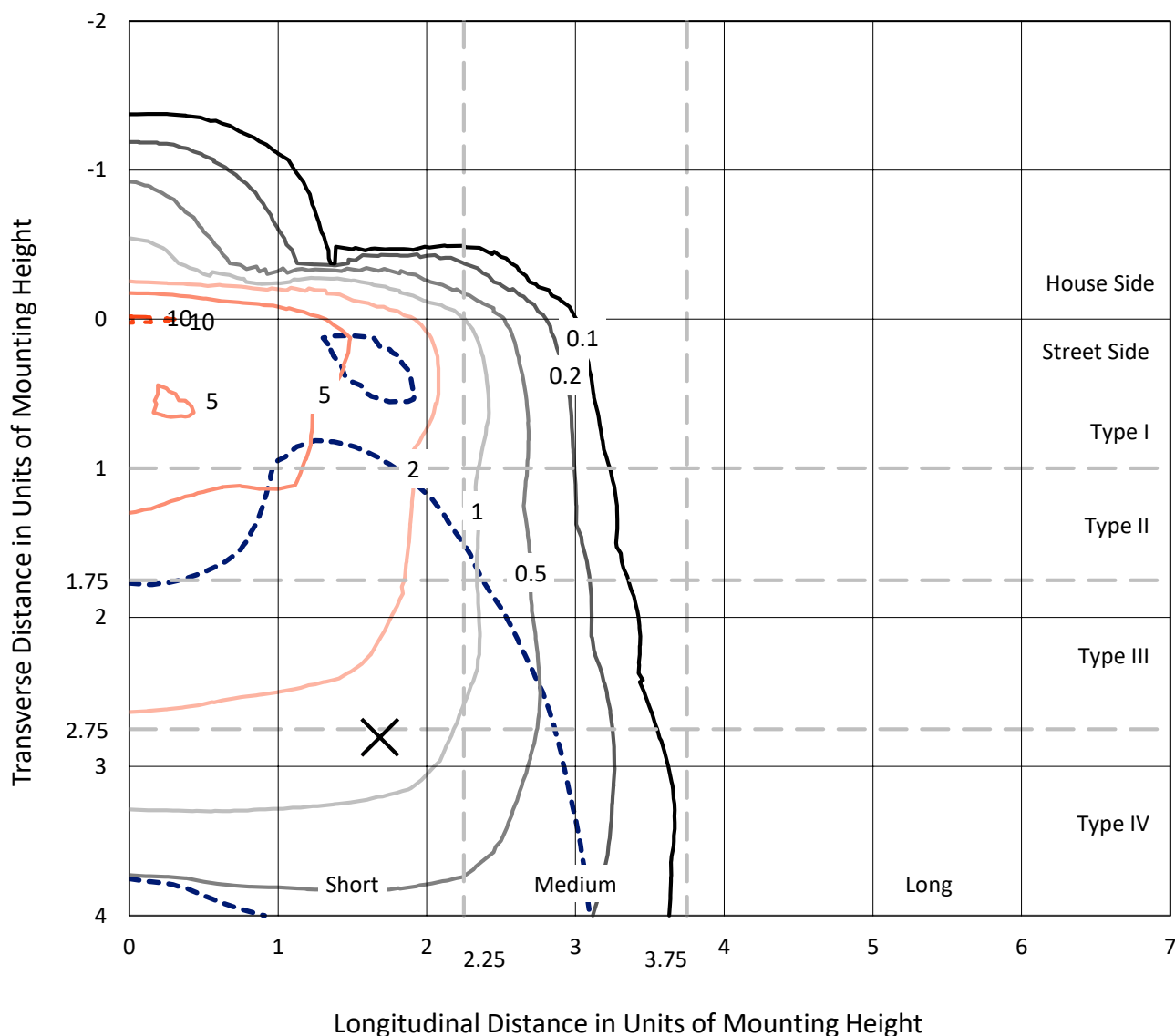
Input Watts (W): 85  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



REPORT NUMBER: P322756  
 CATALOG NUMBER: GLEON-SA2B-722-U-T4FT-HSS

## Iso-Footcandle Lines of Horizontal Illumination

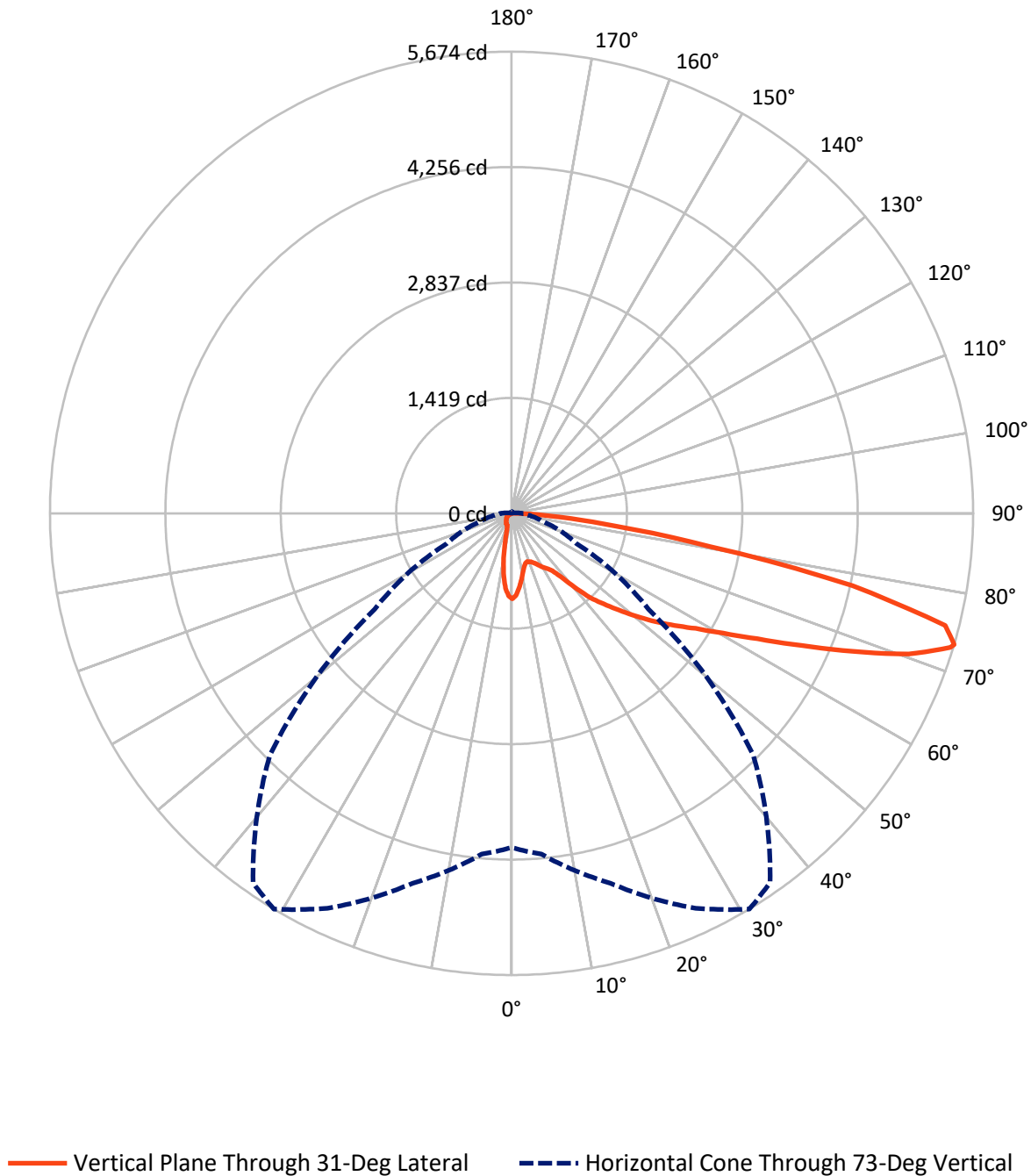
× Max cd  
 - - - 1/2 Max cd



Based on 10 foot mounting height. Maximum calculated value = 10.5 fc  
 Type IV - Short - N/A

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## Luminous Intensity Polar Plot



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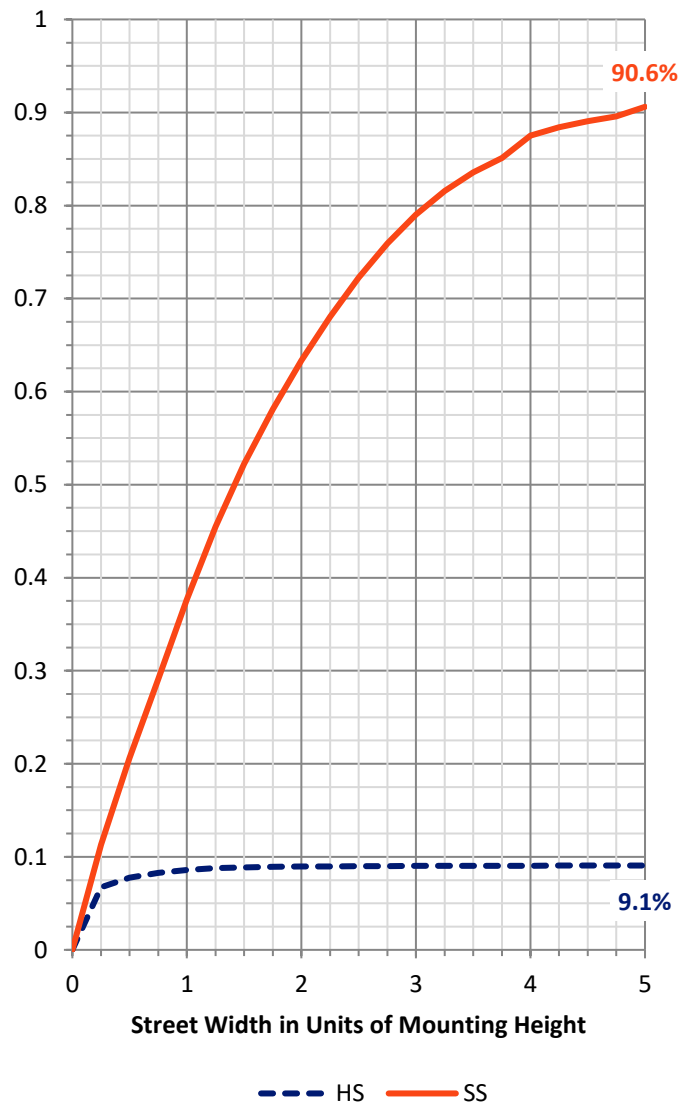
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 556.4    | 0.0    | 556.4  |
|                    | % Fixture | 9.1      | 0.0    | 9.1    |
| <b>Street Side</b> | Lumens    | 5547.6   | 0.0    | 5547.6 |
|                    | % Fixture | 90.9     | 0.0    | 90.9   |
| <b>Total</b>       | Lumens    | 6104.0   | 0.0    | 6104.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 87.1   | 1.4       |
| 10°-20°   | 189.1  | 3.1       |
| 20°-30°   | 283.3  | 4.6       |
| 30°-40°   | 450.7  | 7.4       |
| 40°-50°   | 804.8  | 13.2      |
| 50°-60°   | 1248.9 | 20.5      |
| 60°-70°   | 1660.2 | 27.2      |
| 70°-80°   | 1248.8 | 20.5      |
| 80°-90°   | 131.2  | 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°    | 6104.0 | 100.0     |
| 0°-180°   | 6104.0 | 100.0     |

**Coefficient of Utilization**



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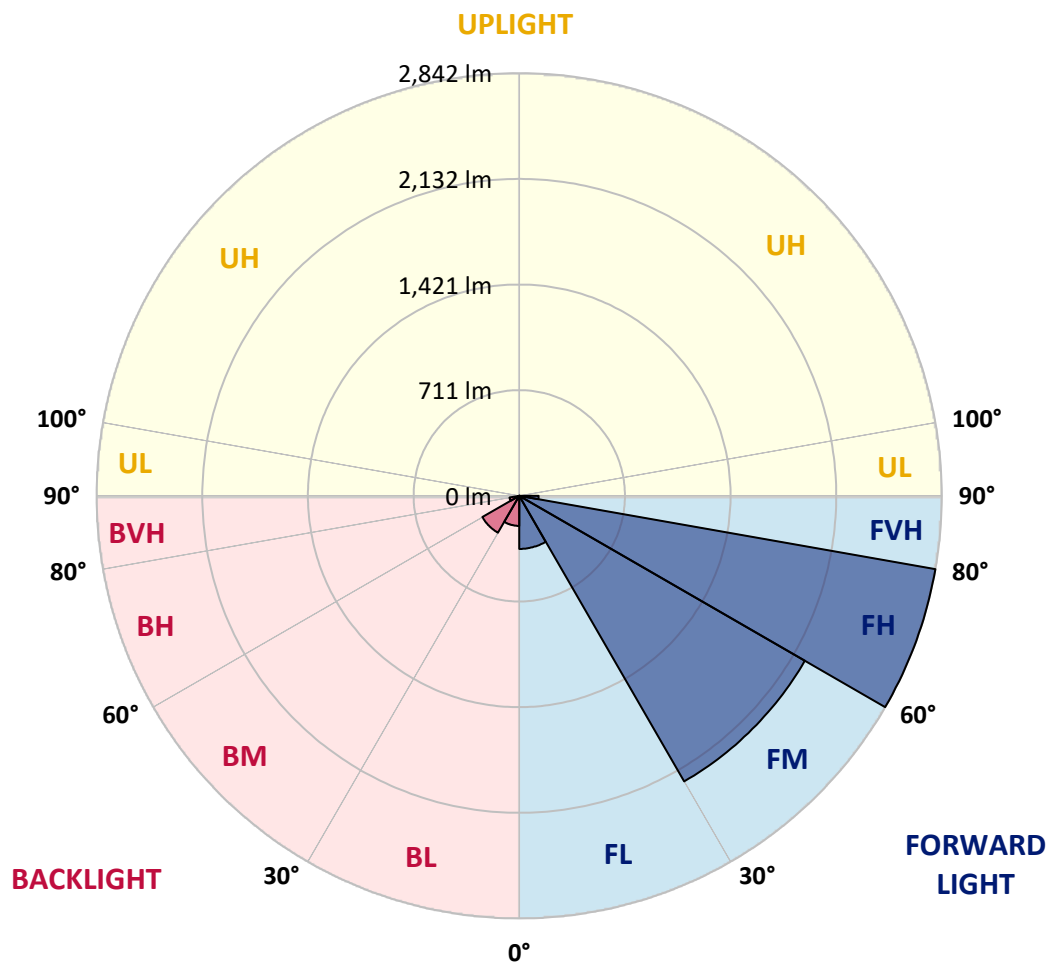
CATALOG NUMBER: GLEON-SA2B-722-U-T4FT-HSS

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 357.1  | 5.9       |                         |      |         |
| FM   | (30°-60°)   | 2218.0 | 36.3      |                         |      |         |
| FH   | (60°-80°)   | 2842.4 | 46.6      |                         |      | G2/5000 |
| FVH  | (80°-90°)   | 130.1  | 2.1       |                         |      | G2/225  |
| BL   | (0°-30°)    | 202.3  | 3.3       | B1/500                  |      |         |
| BM   | (30°-60°)   | 286.4  | 4.7       | B1/1000                 |      |         |
| BH   | (60°-80°)   | 66.6   | 1.1       | B0/110                  |      | G0/110  |
| BVH  | (80°-90°)   | 1.1    | 0.0       |                         |      | G0/10   |
| 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°    | 31°    | 35°    | 45°    | 55°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1050.2 | 1050.2 | 1050.2 | 1050.2 | 1050.2 | 1050.2 | 1050.2 | 1050.2 | 1050.2 | 1050.2 | 1050.2 |
| 2.5°  | 995.2  | 999.4  | 1003.9 | 1004.8 | 1012.3 | 1012.6 | 1023.3 | 1031.4 | 1039.5 | 1047.2 | 1049.9 |
| 5°    | 893.1  | 900.0  | 908.0  | 916.1  | 931.9  | 938.2  | 964.5  | 991.4  | 1017.1 | 1041.5 | 1053.5 |
| 7.5°  | 784.1  | 791.8  | 803.2  | 823.2  | 840.8  | 853.1  | 894.6  | 942.4  | 990.2  | 1035.3 | 1061.3 |
| 10°   | 684.6  | 691.8  | 703.7  | 724.9  | 752.1  | 768.8  | 824.7  | 891.0  | 961.2  | 1029.6 | 1072.9 |
| 12.5° | 621.3  | 625.2  | 631.7  | 654.4  | 678.9  | 697.7  | 763.5  | 845.6  | 937.3  | 1029.3 | 1091.7 |
| 15°   | 609.6  | 610.8  | 605.5  | 615.6  | 634.7  | 652.9  | 719.6  | 808.9  | 919.1  | 1034.1 | 1116.2 |
| 17.5° | 628.2  | 627.6  | 609.6  | 608.4  | 623.7  | 638.6  | 698.0  | 783.5  | 906.2  | 1045.1 | 1147.9 |
| 20°   | 656.2  | 654.1  | 623.1  | 617.4  | 633.5  | 647.6  | 696.6  | 773.9  | 901.5  | 1063.6 | 1186.4 |
| 22.5° | 693.6  | 690.0  | 641.3  | 635.3  | 652.6  | 667.3  | 715.1  | 783.2  | 905.6  | 1088.4 | 1231.2 |
| 25°   | 739.9  | 734.5  | 672.7  | 666.1  | 683.7  | 698.3  | 748.2  | 809.8  | 918.2  | 1118.6 | 1288.0 |
| 27.5° | 792.1  | 784.4  | 722.8  | 705.8  | 725.8  | 741.1  | 792.4  | 850.4  | 937.9  | 1150.6 | 1357.6 |
| 30°   | 841.4  | 831.3  | 775.7  | 747.6  | 772.1  | 789.1  | 840.2  | 898.8  | 969.6  | 1199.9 | 1452.8 |
| 32.5° | 891.0  | 879.7  | 822.9  | 789.4  | 811.5  | 830.1  | 889.5  | 965.4  | 1029.0 | 1275.1 | 1579.5 |
| 35°   | 1005.1 | 993.2  | 923.6  | 868.3  | 868.0  | 878.5  | 958.5  | 1056.5 | 1107.6 | 1380.0 | 1730.6 |
| 37.5° | 1197.2 | 1190.3 | 1124.0 | 1019.1 | 991.1  | 979.4  | 1052.6 | 1165.2 | 1220.5 | 1524.2 | 1901.2 |
| 40°   | 1407.4 | 1401.5 | 1327.1 | 1232.1 | 1189.4 | 1160.7 | 1187.6 | 1316.6 | 1380.0 | 1700.5 | 2075.3 |
| 42.5° | 1644.9 | 1616.5 | 1483.9 | 1455.5 | 1417.3 | 1395.5 | 1371.3 | 1503.3 | 1575.9 | 1892.2 | 2248.0 |
| 45°   | 1860.6 | 1812.8 | 1640.7 | 1597.7 | 1589.0 | 1594.4 | 1607.9 | 1754.2 | 1796.3 | 2120.1 | 2420.0 |
| 47.5° | 1989.0 | 1951.4 | 1819.3 | 1778.1 | 1775.7 | 1811.3 | 1912.8 | 2037.7 | 2015.9 | 2318.8 | 2571.5 |
| 50°   | 2111.2 | 2077.1 | 1967.5 | 1977.6 | 1988.7 | 2037.1 | 2259.0 | 2329.2 | 2216.3 | 2498.9 | 2710.3 |
| 52.5° | 2210.0 | 2158.1 | 2100.7 | 2157.8 | 2212.1 | 2290.1 | 2616.3 | 2590.9 | 2358.5 | 2642.2 | 2829.2 |
| 55°   | 2267.1 | 2243.5 | 2271.3 | 2328.6 | 2430.8 | 2557.4 | 2953.5 | 2808.6 | 2462.4 | 2773.1 | 2908.4 |
| 57.5° | 2476.2 | 2429.9 | 2485.1 | 2534.7 | 2667.9 | 2845.1 | 3242.3 | 2970.8 | 2537.4 | 2854.0 | 2926.6 |
| 60°   | 2729.2 | 2691.8 | 2724.4 | 2806.8 | 2986.6 | 3194.8 | 3512.3 | 3103.1 | 2576.5 | 2906.0 | 2879.4 |
| 62.5° | 3131.8 | 3082.5 | 3062.2 | 3154.5 | 3392.9 | 3620.2 | 3717.2 | 3194.8 | 2567.9 | 2883.0 | 2717.5 |
| 65°   | 3671.2 | 3620.2 | 3529.4 | 3613.0 | 3916.2 | 4076.6 | 3946.3 | 3214.2 | 2508.1 | 2696.9 | 2308.3 |
| 67.5° | 4223.8 | 4186.8 | 4109.1 | 4250.1 | 4523.7 | 4575.4 | 4188.6 | 3167.0 | 2315.8 | 2186.7 | 1630.9 |
| 70°   | 4588.8 | 4573.0 | 4623.5 | 4935.3 | 5179.3 | 5164.4 | 4410.8 | 2913.5 | 1805.0 | 1344.7 | 806.8  |
| 72.5° | 4325.7 | 4401.5 | 4774.3 | 5339.7 | 5637.8 | 5516.0 | 4296.7 | 2237.2 | 1031.7 | 517.3  | 233.3  |
| 73°   | 4107.6 | 4204.7 | 4706.5 | 5355.0 | 5674.0 | 5540.5 | 4200.8 | 2053.5 | 879.4  | 408.3  | 176.8  |
| 75°   | 2857.6 | 2976.8 | 3896.5 | 4987.3 | 5504.9 | 5278.8 | 3501.6 | 1256.9 | 407.4  | 181.0  | 71.4   |
| 77.5° | 1387.4 | 1475.5 | 2145.5 | 3603.4 | 4281.2 | 4124.4 | 2179.9 | 468.4  | 184.0  | 113.2  | 32.9   |
| 80°   | 517.9  | 575.9  | 931.3  | 1834.0 | 2474.1 | 2538.9 | 958.8  | 177.1  | 122.5  | 91.1   | 16.7   |
| 82.5° | 135.6  | 151.1  | 343.5  | 817.8  | 1268.0 | 1327.1 | 302.3  | 89.3   | 89.6   | 75.0   | 10.2   |
| 85°   | 43.3   | 49.6   | 107.2  | 367.1  | 597.4  | 524.5  | 78.9   | 43.3   | 65.1   | 55.9   | 5.7    |
| 87.5° | 5.4    | 6.9    | 34.1   | 86.3   | 131.7  | 73.2   | 12.2   | 12.8   | 27.8   | 31.1   | 3.3    |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |



REPORT NUMBER: P322756

CATALOG NUMBER: GLEON-SA2B-722-U-T4FT-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1050.2 | 1050.2 | 1050.2 | 1050.2 | 1050.2 | 1050.2 | 1050.2 | 1050.2 | 1050.2 | 1050.2 | 1050.2 |
| 2.5°  | 1052.6 | 1051.1 | 1051.4 | 1043.6 | 1038.6 | 1028.4 | 1017.9 | 1013.2 | 1008.1 | 1006.0 | 1008.1 |
| 5°    | 1058.0 | 1055.3 | 1047.5 | 1023.6 | 998.2  | 965.4  | 934.6  | 911.3  | 882.0  | 874.0  | 882.3  |
| 7.5°  | 1066.3 | 1061.0 | 1038.3 | 989.6  | 933.1  | 870.4  | 799.9  | 748.5  | 706.4  | 679.2  | 689.1  |
| 10°   | 1078.6 | 1068.4 | 1022.7 | 940.0  | 839.0  | 727.9  | 627.9  | 549.9  | 494.6  | 471.9  | 471.0  |
| 12.5° | 1099.2 | 1080.1 | 1003.6 | 875.5  | 724.0  | 575.9  | 444.8  | 360.2  | 315.4  | 286.4  | 285.8  |
| 15°   | 1121.9 | 1093.8 | 979.4  | 798.1  | 590.2  | 412.5  | 286.4  | 222.2  | 193.3  | 184.0  | 182.8  |
| 17.5° | 1149.7 | 1109.6 | 948.1  | 702.8  | 450.1  | 273.3  | 187.0  | 168.5  | 167.3  | 166.4  | 166.4  |
| 20°   | 1184.6 | 1128.5 | 907.7  | 593.8  | 319.3  | 182.5  | 158.9  | 160.1  | 160.7  | 159.5  | 159.8  |
| 22.5° | 1225.2 | 1147.6 | 859.6  | 476.7  | 216.0  | 152.6  | 152.0  | 153.5  | 154.1  | 153.5  | 153.8  |
| 25°   | 1272.4 | 1169.7 | 801.1  | 354.0  | 155.9  | 144.9  | 146.4  | 148.5  | 149.9  | 149.9  | 149.9  |
| 27.5° | 1331.0 | 1196.6 | 730.6  | 247.0  | 134.7  | 136.8  | 141.0  | 144.9  | 147.0  | 147.6  | 147.6  |
| 30°   | 1407.1 | 1230.0 | 646.1  | 169.4  | 122.5  | 126.0  | 133.8  | 141.3  | 145.2  | 145.8  | 146.1  |
| 32.5° | 1503.3 | 1267.7 | 548.1  | 125.2  | 112.0  | 114.7  | 123.1  | 135.6  | 143.1  | 144.3  | 144.3  |
| 35°   | 1613.5 | 1311.3 | 442.7  | 109.0  | 104.5  | 105.4  | 112.0  | 126.3  | 139.5  | 142.8  | 143.1  |
| 37.5° | 1734.2 | 1354.3 | 336.6  | 101.9  | 98.3   | 98.3   | 103.0  | 115.3  | 130.8  | 141.0  | 142.2  |
| 40°   | 1846.8 | 1380.3 | 236.0  | 96.2   | 92.6   | 92.6   | 96.8   | 105.7  | 120.4  | 135.6  | 138.9  |
| 42.5° | 1950.8 | 1389.2 | 164.3  | 90.8   | 87.2   | 88.1   | 91.7   | 98.9   | 109.9  | 125.2  | 128.1  |
| 45°   | 2057.7 | 1387.7 | 119.8  | 84.5   | 81.8   | 84.5   | 87.2   | 92.6   | 100.7  | 109.3  | 109.9  |
| 47.5° | 2138.3 | 1375.2 | 95.0   | 78.6   | 76.8   | 80.3   | 82.7   | 86.3   | 90.8   | 90.2   | 90.2   |
| 50°   | 2213.9 | 1344.7 | 76.5   | 70.5   | 71.7   | 75.9   | 77.1   | 78.3   | 78.6   | 72.9   | 72.3   |
| 52.5° | 2271.3 | 1297.2 | 61.2   | 61.8   | 66.6   | 70.8   | 69.6   | 67.8   | 64.8   | 57.9   | 56.8   |
| 55°   | 2290.4 | 1205.8 | 48.1   | 51.1   | 59.1   | 64.5   | 60.0   | 56.2   | 50.5   | 44.8   | 43.6   |
| 57.5° | 2255.7 | 1087.8 | 39.1   | 39.7   | 49.9   | 54.4   | 49.3   | 44.8   | 38.5   | 33.8   | 32.9   |
| 60°   | 2182.3 | 956.7  | 32.3   | 29.9   | 38.5   | 42.4   | 39.1   | 34.6   | 29.0   | 25.4   | 25.1   |
| 62.5° | 2036.5 | 816.9  | 26.6   | 23.3   | 29.3   | 32.6   | 30.5   | 27.2   | 22.4   | 20.0   | 19.7   |
| 65°   | 1730.0 | 653.5  | 21.5   | 18.8   | 22.7   | 25.4   | 23.6   | 21.2   | 17.6   | 15.8   | 15.5   |
| 67.5° | 1207.6 | 441.8  | 17.6   | 15.5   | 17.9   | 20.0   | 18.5   | 17.3   | 14.0   | 13.7   | 14.0   |
| 70°   | 582.5  | 213.0  | 14.6   | 12.5   | 14.0   | 15.5   | 14.9   | 14.0   | 13.4   | 15.5   | 17.9   |
| 72.5° | 167.0  | 71.4   | 11.6   | 10.5   | 11.4   | 12.2   | 12.8   | 12.5   | 14.6   | 18.8   | 21.8   |
| 73°   | 128.4  | 57.6   | 11.1   | 9.9    | 10.8   | 11.9   | 12.5   | 12.2   | 14.9   | 19.1   | 21.8   |
| 75°   | 55.0   | 27.8   | 8.4    | 8.1    | 9.0    | 10.5   | 11.1   | 11.1   | 14.9   | 19.4   | 20.9   |
| 77.5° | 24.8   | 14.9   | 5.4    | 6.3    | 7.8    | 8.4    | 9.3    | 9.3    | 11.9   | 14.9   | 14.9   |
| 80°   | 14.0   | 8.1    | 4.2    | 4.8    | 5.7    | 5.7    | 5.7    | 5.1    | 5.4    | 6.0    | 6.6    |
| 82.5° | 9.0    | 5.4    | 3.3    | 3.9    | 3.6    | 3.0    | 2.4    | 2.4    | 2.1    | 2.4    | 3.0    |
| 85°   | 5.1    | 3.0    | 3.0    | 2.4    | 1.5    | 1.2    | 1.5    | 1.2    | 0.3    | 0.0    | 0.3    |
| 87.5° | 3.0    | 1.8    | 0.9    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 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: SP1-1908-441-10-R4

Test Date: 10/25/2019

Luminaire Tested: SA1C-722-U-5WQ

Data in this report applies to families of products SA1C-722-U-5WQ.

### Test Information

Test Method: LM-79-2008 Report  
 Number: SP1-1908-441-10-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-722-U-5WQ**  
 Description: MCGRAW EDISON ROADWAY AND AREA LUMINAIRE

\*\*\*THIS IS A REVISION OF SP1-1908-441-4-R3. TO UPDATE THE CATALOG INFORMATION.\*\*\*TESTED IN SITU. ROADWAY AND AREA LUMINAIRE. (1) 70 CRI, 5000K, 1050MA LIGHTSQUARE WITH 16 LEDS AND TYPE V WIDE OPTICS.

### Spectral Parameters

|                           |         |           |      |      |       |
|---------------------------|---------|-----------|------|------|-------|
| CCT (K):                  | 2237    | CRI (Ra): | 72.0 |      |       |
| CIE u':                   | 0.2876  | R1:       | 68.9 | R9:  | -17.4 |
| CIE v':                   | 0.5346  | R2:       | 83.0 | R10: | 61.3  |
| Duv:                      | -0.0006 | R3:       | 95.2 | R11: | 59.8  |
| CIE x:                    | 0.5005  | R4:       | 66.2 | R12: | 50.5  |
| CIE y:                    | 0.4134  | R5:       | 65.9 | R13: | 71.1  |
| CIE z:                    | 0.0860  | R6:       | 76.3 | R14: | 96.9  |
| Peak Wavelength (nm):     | 603     | R7:       | 76.7 |      |       |
| Dominant Wavelength (nm): | 587     | R8:       | 43.8 |      |       |
| Purity:                   | 74.5    |           |      |      |       |
| Rf:                       | 69.8    |           |      |      |       |
| Rg:                       | 99.2    |           |      |      |       |



### Test Conditions

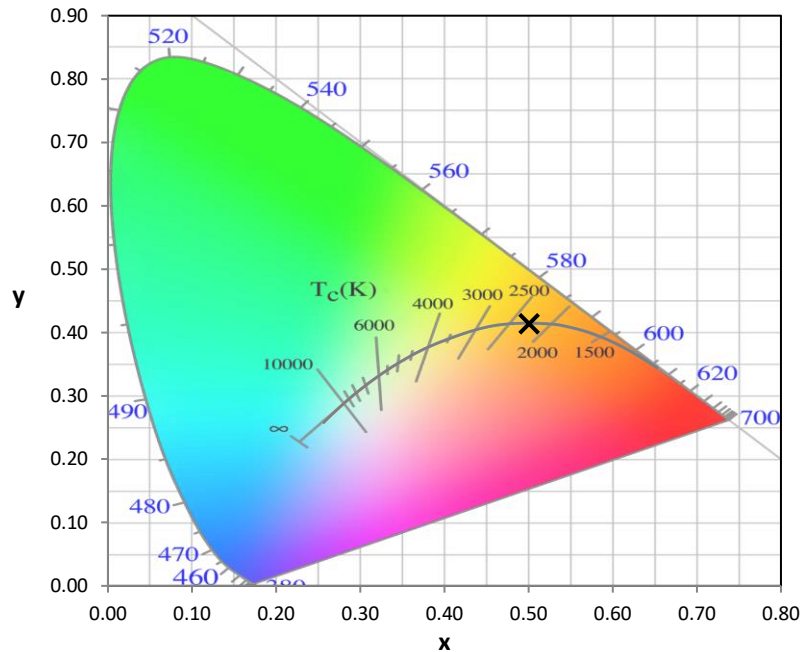
Stabilization Time: 71M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 24.7/41%  
 Sphere Temperature (°C): 25.6

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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 2200K 4-step quadrangle

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**Photopic Flux vs. Wavelength**



#####

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 1768             | NR               | 490       | 5206             | NR               | 620       | 130919           | NR               | 750       | 8553             | NR               | 880       | 2713             | NR               |
| 365       | 1569             | NR               | 495       | 7286             | NR               | 625       | 125335           | NR               | 755       | 7696             | NR               | 885       | 2316             | NR               |
| 370       | 1594             | NR               | 500       | 10654            | NR               | 630       | 118388           | NR               | 760       | 6978             | NR               | 890       | 2539             | NR               |
| 375       | 1744             | NR               | 505       | 15189            | NR               | 635       | 111855           | NR               | 765       | 6377             | NR               | 895       | 1933             | NR               |
| 380       | 1659             | NR               | 510       | 20541            | NR               | 640       | 104062           | NR               | 770       | 5600             | NR               | 900       | 2216             | NR               |
| 385       | 1504             | NR               | 515       | 26492            | NR               | 645       | 96365            | NR               | 775       | 5000             | NR               | 905       | 2067             | NR               |
| 390       | 1541             | NR               | 520       | 32294            | NR               | 650       | 88651            | NR               | 780       | 4709             | NR               | 910       | 1959             | NR               |
| 395       | 1355             | NR               | 525       | 38123            | NR               | 655       | 81152            | NR               | 785       | 4305             | NR               | 915       | 1874             | NR               |
| 400       | 1243             | NR               | 530       | 43232            | NR               | 660       | 73523            | NR               | 790       | 4040             | NR               | 920       | 1484             | NR               |
| 405       | 1417             | NR               | 535       | 48012            | NR               | 665       | 66123            | NR               | 795       | 3642             | NR               | 925       | 1914             | NR               |
| 410       | 2147             | NR               | 540       | 52623            | NR               | 670       | 58677            | NR               | 800       | 3594             | NR               | 930       | 1948             | NR               |
| 415       | 3837             | NR               | 545       | 57516            | NR               | 675       | 52349            | NR               | 805       | 3190             | NR               | 935       | 2079             | NR               |
| 420       | 7159             | NR               | 550       | 62613            | NR               | 680       | 46159            | NR               | 810       | 3241             | NR               | 940       | 2263             | NR               |
| 425       | 12599            | NR               | 555       | 68554            | NR               | 685       | 40525            | NR               | 815       | 2732             | NR               | 945       | 1688             | NR               |
| 430       | 19019            | NR               | 560       | 75325            | NR               | 690       | 35615            | NR               | 820       | 2612             | NR               | 950       | 1560             | NR               |
| 435       | 24875            | NR               | 565       | 82533            | NR               | 695       | 31158            | NR               | 825       | 2966             | NR               | 955       | 2826             | NR               |
| 440       | 29103            | NR               | 570       | 90909            | NR               | 700       | 27409            | NR               | 830       | 2574             | NR               | 960       | 1477             | NR               |
| 445       | 29901            | NR               | 575       | 99621            | NR               | 705       | 24204            | NR               | 835       | 2633             | NR               | 965       | 1568             | NR               |
| 450       | 24862            | NR               | 580       | 108484           | NR               | 710       | 21558            | NR               | 840       | 2526             | NR               | 970       | 2030             | NR               |
| 455       | 15942            | NR               | 585       | 116679           | NR               | 715       | 19222            | NR               | 845       | 2631             | NR               | 975       | 1986             | NR               |
| 460       | 9916             | NR               | 590       | 123752           | NR               | 720       | 17310            | NR               | 850       | 2079             | NR               | 980       | 2540             | NR               |
| 465       | 7051             | NR               | 595       | 129324           | NR               | 725       | 15280            | NR               | 855       | 2309             | NR               | 985       | 1139             | NR               |
| 470       | 5227             | NR               | 600       | 134082           | NR               | 730       | 13282            | NR               | 860       | 2528             | NR               | 990       | 2018             | NR               |
| 475       | 4257             | NR               | 605       | 135698           | NR               | 735       | 11753            | NR               | 865       | 2121             | NR               | 995       | 3445             | NR               |
| 480       | 4052             | NR               | 610       | 135144           | NR               | 740       | 10654            | NR               | 870       | 2751             | NR               | 1000      | 3704             | NR               |
| 485       | 4298             | NR               | 615       | 134180           | NR               | 745       | 9451             | NR               | 875       | 2317             | NR               |           |                  |                  |

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Scotopic Flux vs. Wavelength



Scotopic Lumens: 4696.9

S/P: 0.85

| 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       | 1768             | NR               | 490       | 5206             | NR               | 620       | 130919           | NR               | 750       | 8553             | NR               | 880       | 2713             | NR               |
| 365       | 1569             | NR               | 495       | 7286             | NR               | 625       | 125335           | NR               | 755       | 7696             | NR               | 885       | 2316             | NR               |
| 370       | 1594             | NR               | 500       | 10654            | NR               | 630       | 118388           | NR               | 760       | 6978             | NR               | 890       | 2539             | NR               |
| 375       | 1744             | NR               | 505       | 15189            | NR               | 635       | 111855           | NR               | 765       | 6377             | NR               | 895       | 1933             | NR               |
| 380       | 1659             | NR               | 510       | 20541            | NR               | 640       | 104062           | NR               | 770       | 5600             | NR               | 900       | 2216             | NR               |
| 385       | 1504             | NR               | 515       | 26492            | NR               | 645       | 96365            | NR               | 775       | 5000             | NR               | 905       | 2067             | NR               |
| 390       | 1541             | NR               | 520       | 32294            | NR               | 650       | 88651            | NR               | 780       | 4709             | NR               | 910       | 1959             | NR               |
| 395       | 1355             | NR               | 525       | 38123            | NR               | 655       | 81152            | NR               | 785       | 4305             | NR               | 915       | 1874             | NR               |
| 400       | 1243             | NR               | 530       | 43232            | NR               | 660       | 73523            | NR               | 790       | 4040             | NR               | 920       | 1484             | NR               |
| 405       | 1417             | NR               | 535       | 48012            | NR               | 665       | 66123            | NR               | 795       | 3642             | NR               | 925       | 1914             | NR               |
| 410       | 2147             | NR               | 540       | 52623            | NR               | 670       | 58677            | NR               | 800       | 3594             | NR               | 930       | 1948             | NR               |
| 415       | 3837             | NR               | 545       | 57516            | NR               | 675       | 52349            | NR               | 805       | 3190             | NR               | 935       | 2079             | NR               |
| 420       | 7159             | NR               | 550       | 62613            | NR               | 680       | 46159            | NR               | 810       | 3241             | NR               | 940       | 2263             | NR               |
| 425       | 12599            | NR               | 555       | 68554            | NR               | 685       | 40525            | NR               | 815       | 2732             | NR               | 945       | 1688             | NR               |
| 430       | 19019            | NR               | 560       | 75325            | NR               | 690       | 35615            | NR               | 820       | 2612             | NR               | 950       | 1560             | NR               |
| 435       | 24875            | NR               | 565       | 82533            | NR               | 695       | 31158            | NR               | 825       | 2966             | NR               | 955       | 2826             | NR               |
| 440       | 29103            | NR               | 570       | 90909            | NR               | 700       | 27409            | NR               | 830       | 2574             | NR               | 960       | 1477             | NR               |
| 445       | 29901            | NR               | 575       | 99621            | NR               | 705       | 24204            | NR               | 835       | 2633             | NR               | 965       | 1568             | NR               |
| 450       | 24862            | NR               | 580       | 108484           | NR               | 710       | 21558            | NR               | 840       | 2526             | NR               | 970       | 2030             | NR               |
| 455       | 15942            | NR               | 585       | 116679           | NR               | 715       | 19222            | NR               | 845       | 2631             | NR               | 975       | 1986             | NR               |
| 460       | 9916             | NR               | 590       | 123752           | NR               | 720       | 17310            | NR               | 850       | 2079             | NR               | 980       | 2540             | NR               |
| 465       | 7051             | NR               | 595       | 129324           | NR               | 725       | 15280            | NR               | 855       | 2309             | NR               | 985       | 1139             | NR               |
| 470       | 5227             | NR               | 600       | 134082           | NR               | 730       | 13282            | NR               | 860       | 2528             | NR               | 990       | 2018             | NR               |
| 475       | 4257             | NR               | 605       | 135698           | NR               | 735       | 11753            | NR               | 865       | 2121             | NR               | 995       | 3445             | NR               |
| 480       | 4052             | NR               | 610       | 135144           | NR               | 740       | 10654            | NR               | 870       | 2751             | NR               | 1000      | 3704             | NR               |
| 485       | 4298             | NR               | 615       | 134180           | NR               | 745       | 9451             | NR               | 875       | 2317             | NR               |           |                  |                  |

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**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: 1470.8 M/P: 0.27**

| 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       | 1768             | NR               | 490       | 5206             | NR               | 620       | 130919           | NR               | 750       | 8553             | NR               | 880       | 2713             | NR               |
| 365       | 1569             | NR               | 495       | 7286             | NR               | 625       | 125335           | NR               | 755       | 7696             | NR               | 885       | 2316             | NR               |
| 370       | 1594             | NR               | 500       | 10654            | NR               | 630       | 118388           | NR               | 760       | 6978             | NR               | 890       | 2539             | NR               |
| 375       | 1744             | NR               | 505       | 15189            | NR               | 635       | 111855           | NR               | 765       | 6377             | NR               | 895       | 1933             | NR               |
| 380       | 1659             | NR               | 510       | 20541            | NR               | 640       | 104062           | NR               | 770       | 5600             | NR               | 900       | 2216             | NR               |
| 385       | 1504             | NR               | 515       | 26492            | NR               | 645       | 96365            | NR               | 775       | 5000             | NR               | 905       | 2067             | NR               |
| 390       | 1541             | NR               | 520       | 32294            | NR               | 650       | 88651            | NR               | 780       | 4709             | NR               | 910       | 1959             | NR               |
| 395       | 1355             | NR               | 525       | 38123            | NR               | 655       | 81152            | NR               | 785       | 4305             | NR               | 915       | 1874             | NR               |
| 400       | 1243             | NR               | 530       | 43232            | NR               | 660       | 73523            | NR               | 790       | 4040             | NR               | 920       | 1484             | NR               |
| 405       | 1417             | NR               | 535       | 48012            | NR               | 665       | 66123            | NR               | 795       | 3642             | NR               | 925       | 1914             | NR               |
| 410       | 2147             | NR               | 540       | 52623            | NR               | 670       | 58677            | NR               | 800       | 3594             | NR               | 930       | 1948             | NR               |
| 415       | 3837             | NR               | 545       | 57516            | NR               | 675       | 52349            | NR               | 805       | 3190             | NR               | 935       | 2079             | NR               |
| 420       | 7159             | NR               | 550       | 62613            | NR               | 680       | 46159            | NR               | 810       | 3241             | NR               | 940       | 2263             | NR               |
| 425       | 12599            | NR               | 555       | 68554            | NR               | 685       | 40525            | NR               | 815       | 2732             | NR               | 945       | 1688             | NR               |
| 430       | 19019            | NR               | 560       | 75325            | NR               | 690       | 35615            | NR               | 820       | 2612             | NR               | 950       | 1560             | NR               |
| 435       | 24875            | NR               | 565       | 82533            | NR               | 695       | 31158            | NR               | 825       | 2966             | NR               | 955       | 2826             | NR               |
| 440       | 29103            | NR               | 570       | 90909            | NR               | 700       | 27409            | NR               | 830       | 2574             | NR               | 960       | 1477             | NR               |
| 445       | 29901            | NR               | 575       | 99621            | NR               | 705       | 24204            | NR               | 835       | 2633             | NR               | 965       | 1568             | NR               |
| 450       | 24862            | NR               | 580       | 108484           | NR               | 710       | 21558            | NR               | 840       | 2526             | NR               | 970       | 2030             | NR               |
| 455       | 15942            | NR               | 585       | 116679           | NR               | 715       | 19222            | NR               | 845       | 2631             | NR               | 975       | 1986             | NR               |
| 460       | 9916             | NR               | 590       | 123752           | NR               | 720       | 17310            | NR               | 850       | 2079             | NR               | 980       | 2540             | NR               |
| 465       | 7051             | NR               | 595       | 129324           | NR               | 725       | 15280            | NR               | 855       | 2309             | NR               | 985       | 1139             | NR               |
| 470       | 5227             | NR               | 600       | 134082           | NR               | 730       | 13282            | NR               | 860       | 2528             | NR               | 990       | 2018             | NR               |
| 475       | 4257             | NR               | 605       | 135698           | NR               | 735       | 11753            | NR               | 865       | 2121             | NR               | 995       | 3445             | NR               |
| 480       | 4052             | NR               | 610       | 135144           | NR               | 740       | 10654            | NR               | 870       | 2751             | NR               | 1000      | 3704             | NR               |
| 485       | 4298             | NR               | 615       | 134180           | NR               | 745       | 9451             | NR               | 875       | 2317             | NR               |           |                  |                  |

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### Summary

$R_f = 69.8$   
 $R_g = 99.2$   
 CIE  $R_a = 72.0$   
 $R_g = -17.4$



### Color Vector Graphics





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

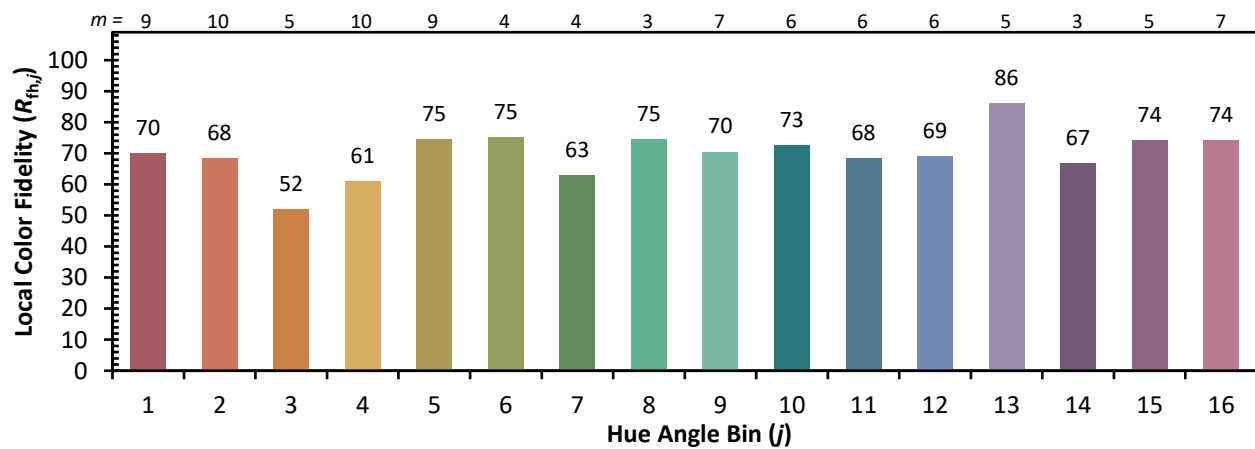
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 87 | CES26 = 56 | CES51 = 74 | CES76 = 56 |
| CES02 = 65 | CES27 = 76 | CES52 = 76 | CES77 = 81 |
| CES03 = 32 | CES28 = 83 | CES53 = 65 | CES78 = 63 |
| CES04 = 72 | CES29 = 46 | CES54 = 78 | CES79 = 84 |
| CES05 = 52 | CES30 = 48 | CES55 = 75 | CES80 = 84 |
| CES06 = 52 | CES31 = 51 | CES56 = 65 | CES81 = 63 |
| CES07 = 44 | CES32 = 51 | CES57 = 62 | CES82 = 92 |
| CES08 = 42 | CES33 = 53 | CES58 = 66 | CES83 = 83 |
| CES09 = 29 | CES34 = 70 | CES59 = 84 | CES84 = 92 |
| CES10 = 78 | CES35 = 85 | CES60 = 90 | CES85 = 81 |
| CES11 = 61 | CES36 = 78 | CES61 = 84 | CES86 = 56 |
| CES12 = 68 | CES37 = 80 | CES62 = 70 | CES87 = 78 |
| CES13 = 45 | CES38 = 53 | CES63 = 68 | CES88 = 72 |
| CES14 = 75 | CES39 = 90 | CES64 = 69 | CES89 = 62 |
| CES15 = 72 | CES40 = 84 | CES65 = 67 | CES90 = 67 |
| CES16 = 49 | CES41 = 75 | CES66 = 64 | CES91 = 90 |
| CES17 = 51 | CES42 = 79 | CES67 = 63 | CES92 = 67 |
| CES18 = 57 | CES43 = 64 | CES68 = 69 | CES93 = 79 |
| CES19 = 74 | CES44 = 98 | CES69 = 80 | CES94 = 52 |
| CES20 = 68 | CES45 = 73 | CES70 = 63 | CES95 = 76 |
| CES21 = 89 | CES46 = 67 | CES71 = 63 | CES96 = 78 |
| CES22 = 81 | CES47 = 60 | CES72 = 87 | CES97 = 77 |
| CES23 = 92 | CES48 = 48 | CES73 = 56 | CES98 = 71 |
| CES24 = 92 | CES49 = 64 | CES74 = 87 | CES99 = 65 |
| CES25 = 74 | CES50 = 74 | CES75 = 66 |            |



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Color Rendition by Hue-Angle Bin



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**Measure Comparisons**



(END OF REPORT)