

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



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

Test Report Prepared for
Cooper Lighting Solutions
(formerly Eaton)

Brand: McGRAW-EDISON

Report Number: P321088

Luminaire Tested: **GLEON-SA4C-827-U-AFL**

Issue Date: 3/3/2020

Test Information

Test Method: LM-79-08
Report Number: P321088
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-29)
Test Lab: INNOVATION CENTER
Issue Date: 3/3/2020
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line: McGRAW-EDISON
Catalog Number: GLEON-SA4C-827-U-AFL
Description: GALLEON AREA AND ROADWAY LUMINAIRE
(4) 80 CRI, 2700K, 1050mA LIGHTSQUARES WITH 16 LEDS EACH AND AUTOMOTIVE FRONTLINE OPTICS
Light Source: -
Ballast/Driver: ELECTRONIC DRIVER

Summary

Lumens per Lamp: N/A
Luminaire Lumens: 21518 lumens
Efficiency: N/A
Efficacy: 95.6 lumens/watt
Luminous Opening: Rectangular (W 1' x L: 1' x H: 0')
IES Classification: Type II - Short
BUG Rating: B3 - U0 - G2

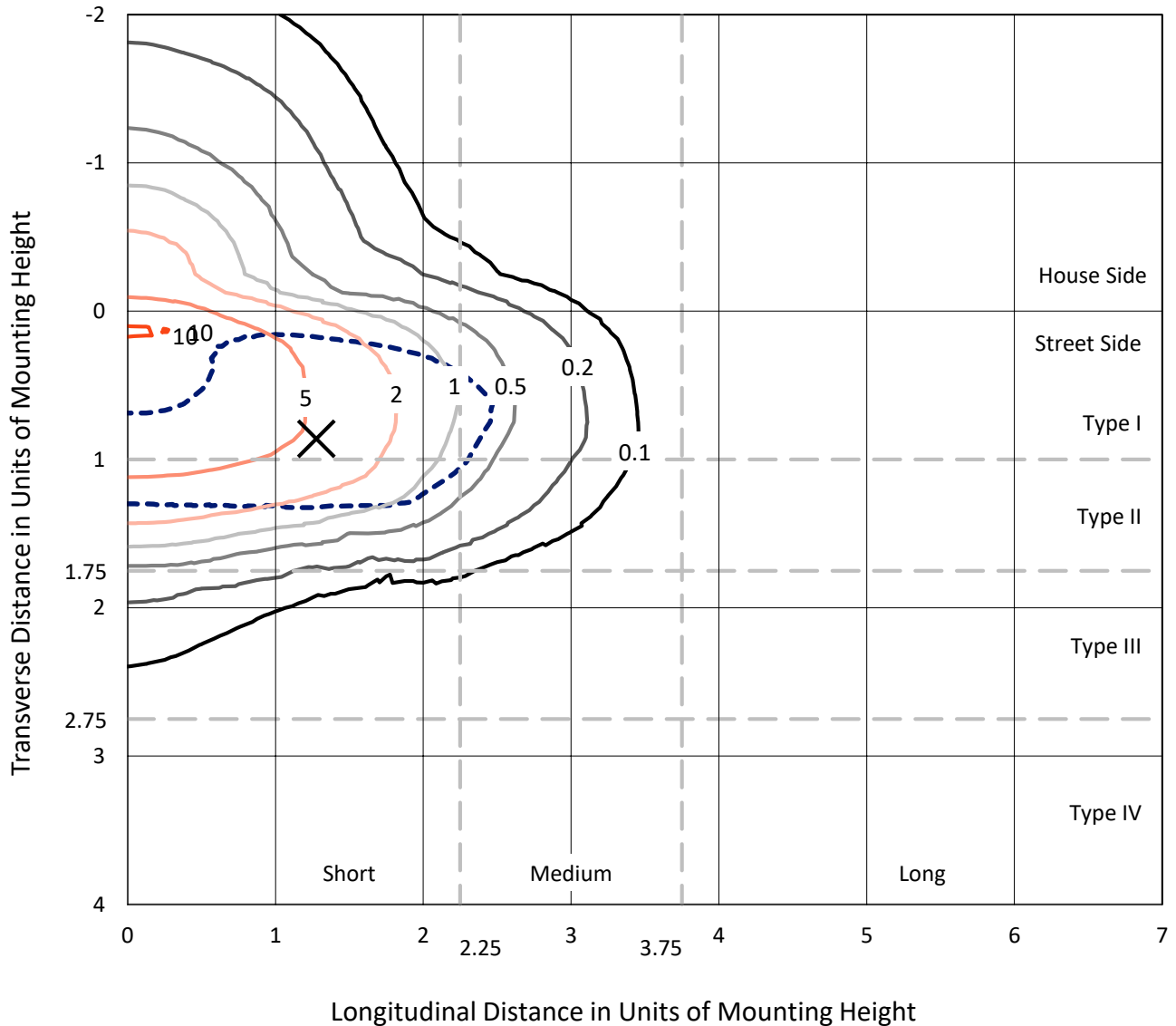
Input Watts (W): 225
Input Voltage (V): NR
Input Current (Ain): NR
Voltage Rise (V): NR
Power Factor: NR
Total Harmonic Distortion (THDi): NR
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 24 FT



REPORT NUMBER: P321088
 CATALOG NUMBER: GLEON-SA4C-827-U-AFL

Iso-Footcandle Lines of Horizontal Illumination

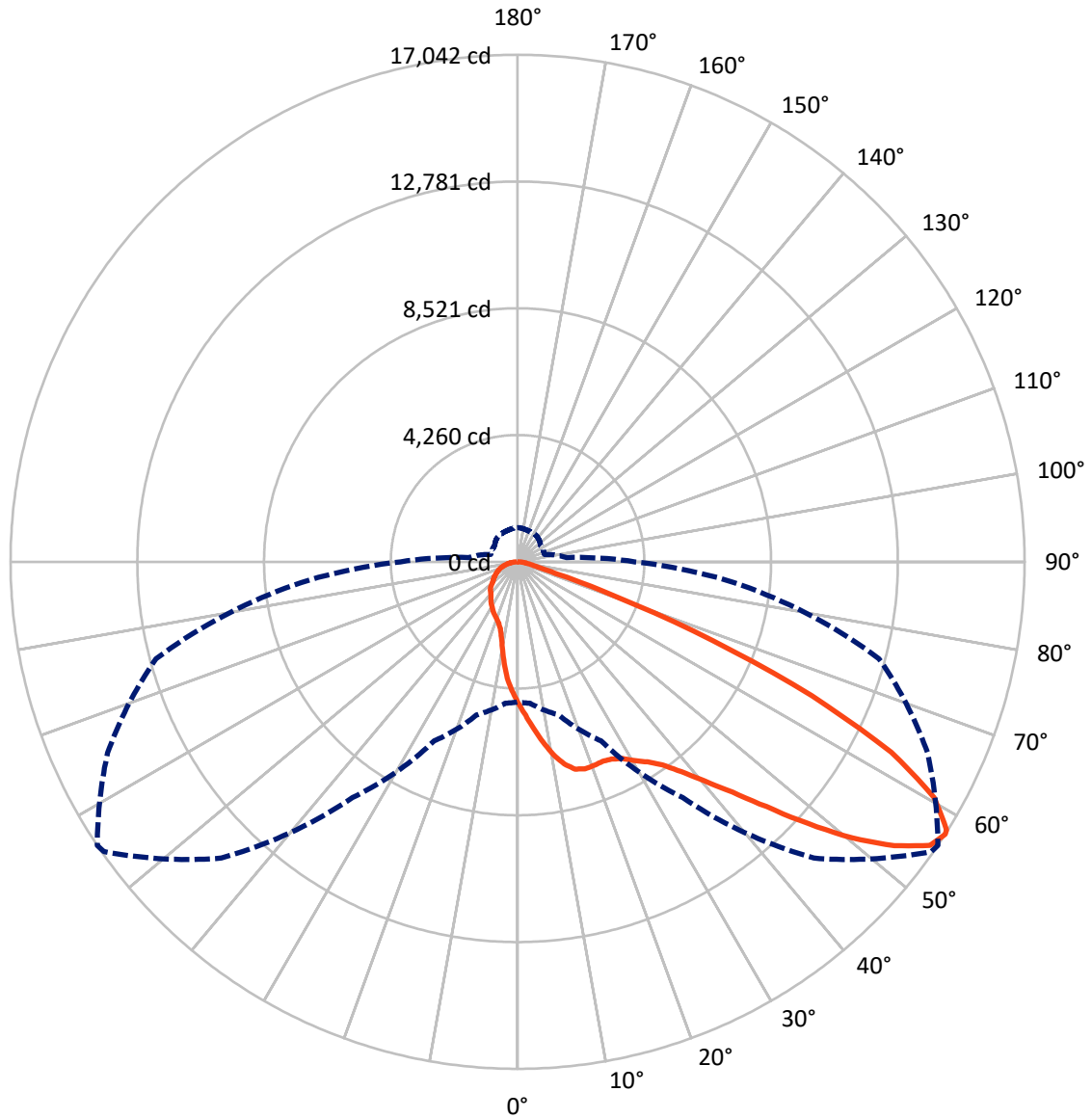
✕ Max cd
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 10.6 fc
 Type II - Short - N/A

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Luminous Intensity Polar Plot



— Vertical Plane Through 56-Deg Lateral - - - Horizontal Cone Through 57-Deg Vertical

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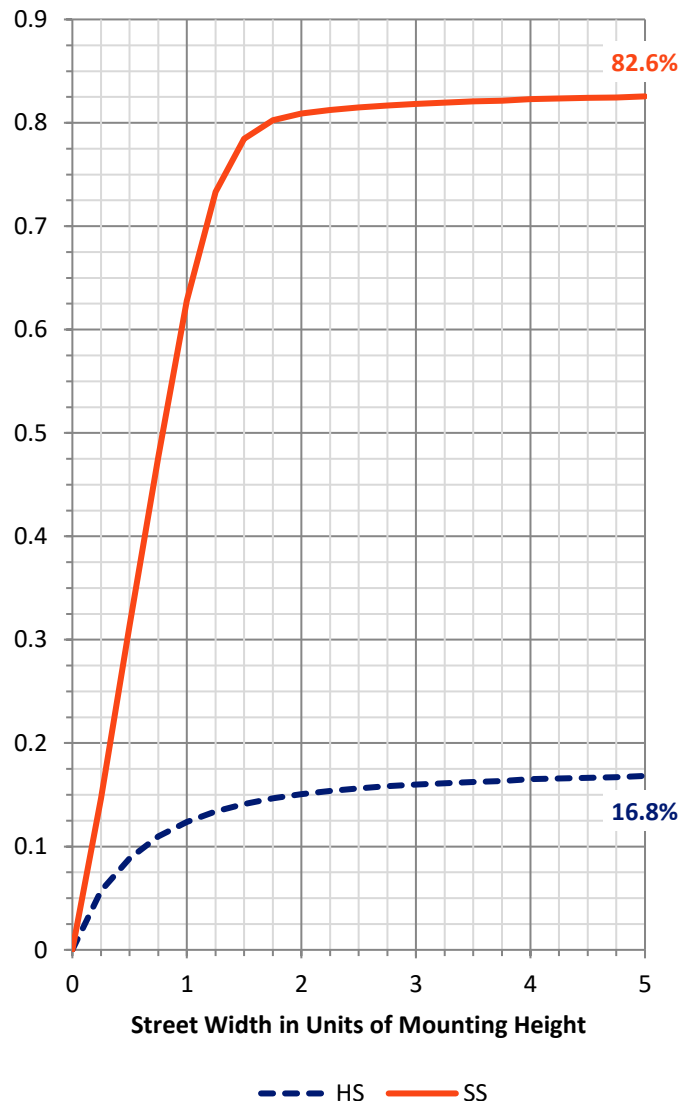
FLUX DISTRIBUTION:

| | | Downward | Upward | Total |
|--------------------|-----------|----------|--------|---------|
| House Side | Lumens | 3709.2 | 0.0 | 3709.2 |
| | % Fixture | 17.2 | 0.0 | 17.2 |
| Street Side | Lumens | 17808.8 | 0.0 | 17808.8 |
| | % Fixture | 82.8 | 0.0 | 82.8 |
| Total | Lumens | 21518.0 | 0.0 | 21518.0 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

ZONAL LUMENS:

| Zone | Lumens | % Fixture |
|-----------|---------|-----------|
| 0°-10° | 455.9 | 2.1 |
| 10°-20° | 1289.0 | 6.0 |
| 20°-30° | 2099.5 | 9.8 |
| 30°-40° | 3138.5 | 14.6 |
| 40°-50° | 4760.4 | 22.1 |
| 50°-60° | 5335.6 | 24.8 |
| 60°-70° | 3151.4 | 14.6 |
| 70°-80° | 1032.5 | 4.8 |
| 80°-90° | 255.1 | 1.2 |
| 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° | 21518.0 | 100.0 |
| 0°-180° | 21518.0 | 100.0 |

Coefficient of Utilization



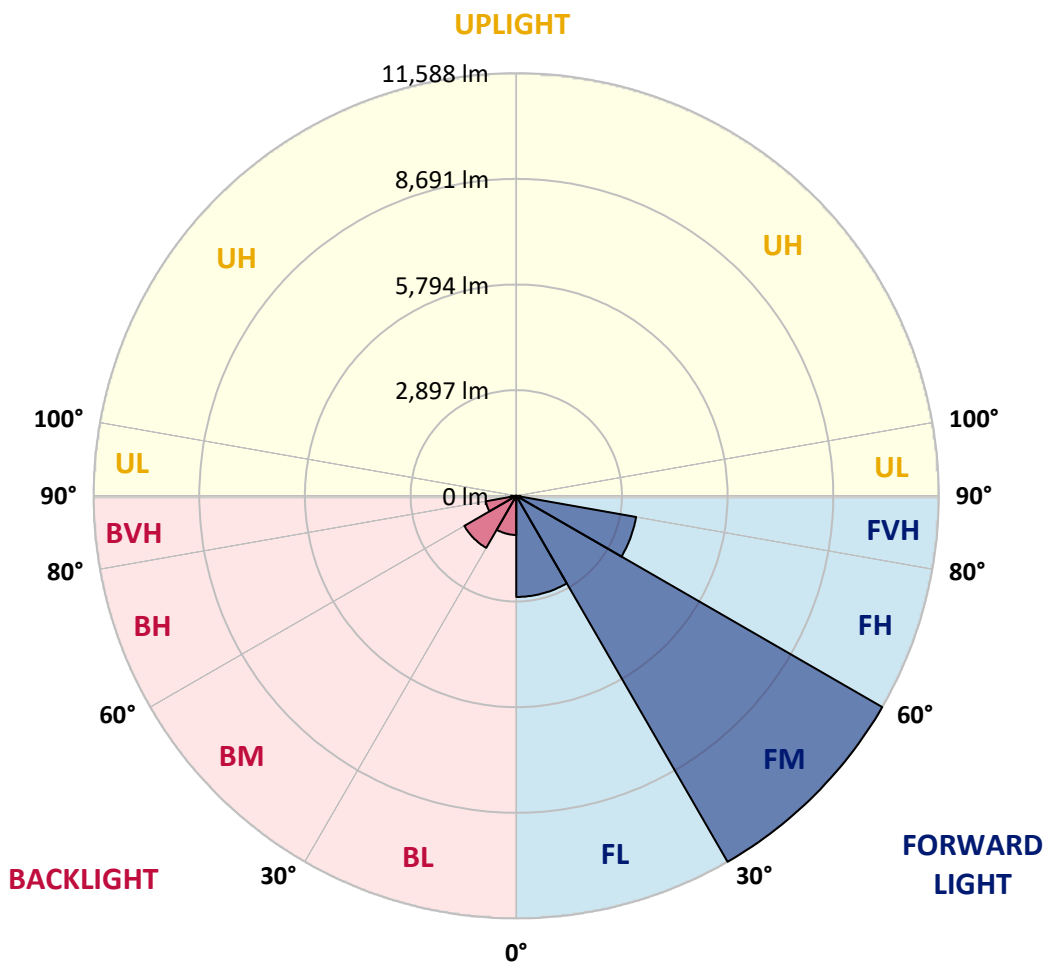
REPORT NUMBER: P321088
 CATALOG NUMBER: GLEON-SA4C-827-U-AFL

LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | Lumens | % Fixture | Zone Rating/Lumen Limit | | |
|----------------|---------|-----------|-------------------------|------|---------|
| | | | B | U | G |
| FL (0°-30°) | 2771.8 | 12.9 | | | |
| FM (30°-60°) | 11588.2 | 53.9 | | | |
| FH (60°-80°) | 3336.4 | 15.5 | | | G2/5000 |
| FVH (80°-90°) | 112.3 | 0.5 | | | G2/225 |
| BL (0°-30°) | 1072.5 | 5.0 | B3/2500 | | |
| BM (30°-60°) | 1646.4 | 7.7 | B2/2500 | | |
| BH (60°-80°) | 847.5 | 3.9 | B2/1000 | | G2/1000 |
| BVH (80°-90°) | 142.8 | 0.7 | | | G2/225 |
| UL (90°-100°) | 0.0 | 0.0 | | U0/0 | |
| UH (100°-180°) | 0.0 | 0.0 | | U0/0 | |

BUG Rating: B3-U0-G2

Type II Short





REPORT NUMBER: P321088
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CANDELA DISTRIBUTION (FULL):

| | 0° | 5° | 15° | 25° | 35° | 45° | 55° | 56° | 65° | 75° | 85° |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--------|
| 0° | 4772.7 | 4772.7 | 4772.7 | 4772.7 | 4772.7 | 4772.7 | 4772.7 | 4772.7 | 4772.7 | 4772.7 | 4772.7 |
| 2.5° | 5480.4 | 5530.7 | 5508.5 | 5431.6 | 5372.4 | 5288.9 | 5195.7 | 5167.6 | 5069.3 | 4959.1 | 4826.7 |
| 5° | 6347.8 | 6322.7 | 6286.5 | 6166.7 | 6040.2 | 5893.0 | 5659.4 | 5622.4 | 5403.5 | 5154.3 | 4891.0 |
| 7.5° | 6841.8 | 6839.6 | 6818.2 | 6747.9 | 6632.5 | 6440.3 | 6158.5 | 6114.9 | 5784.3 | 5383.5 | 4975.3 |
| 10° | 6770.1 | 6764.9 | 6800.4 | 6873.6 | 6908.4 | 6868.4 | 6631.1 | 6587.4 | 6181.5 | 5637.2 | 5072.9 |
| 12.5° | 6362.6 | 6365.6 | 6422.5 | 6576.3 | 6785.6 | 7037.1 | 6998.6 | 6977.2 | 6593.4 | 5924.1 | 5191.3 |
| 15° | 6045.4 | 6052.0 | 6097.2 | 6231.0 | 6478.0 | 6934.3 | 7221.9 | 7229.3 | 6991.9 | 6240.6 | 5329.6 |
| 17.5° | 5906.4 | 5920.4 | 5941.1 | 6035.0 | 6261.3 | 6729.4 | 7275.2 | 7315.1 | 7341.0 | 6568.9 | 5462.7 |
| 20° | 5950.7 | 5964.0 | 5970.0 | 6029.9 | 6215.5 | 6605.2 | 7238.2 | 7309.9 | 7608.7 | 6878.1 | 5595.8 |
| 22.5° | 6149.7 | 6157.8 | 6161.5 | 6177.0 | 6321.2 | 6640.7 | 7213.8 | 7289.2 | 7802.4 | 7155.4 | 5696.3 |
| 25° | 6479.5 | 6473.6 | 6449.9 | 6429.9 | 6526.8 | 6781.2 | 7270.0 | 7341.7 | 7959.9 | 7406.8 | 5762.2 |
| 27.5° | 6874.4 | 6867.0 | 6821.1 | 6766.4 | 6821.9 | 7000.1 | 7431.9 | 7488.9 | 8101.2 | 7642.0 | 5795.4 |
| 30° | 7348.4 | 7329.2 | 7242.6 | 7177.6 | 7199.0 | 7328.4 | 7698.9 | 7750.7 | 8319.3 | 7908.9 | 5828.0 |
| 32.5° | 7896.3 | 7875.6 | 7750.7 | 7642.7 | 7642.7 | 7750.7 | 7974.0 | 8016.9 | 8504.2 | 8210.6 | 5880.5 |
| 35° | 8582.6 | 8556.7 | 8394.0 | 8212.9 | 8161.8 | 8216.5 | 8348.9 | 8379.2 | 8837.0 | 8590.7 | 5975.9 |
| 37.5° | 9391.6 | 9356.9 | 9146.1 | 8903.5 | 8791.9 | 8788.9 | 8884.3 | 8946.4 | 9368.7 | 9089.9 | 6137.8 |
| 40° | 10202.8 | 10178.4 | 9994.3 | 9803.5 | 9584.6 | 9514.4 | 9661.5 | 9680.8 | 10063.8 | 9709.6 | 6344.9 |
| 42.5° | 10829.9 | 10825.5 | 10791.5 | 10816.6 | 10592.6 | 10450.6 | 10565.9 | 10581.5 | 10912.8 | 10380.3 | 6565.3 |
| 45° | 11161.2 | 11168.6 | 11333.5 | 11698.8 | 11781.7 | 11678.1 | 11735.1 | 11739.5 | 11883.0 | 11057.0 | 6767.1 |
| 47.5° | 10895.7 | 10934.2 | 11351.3 | 12168.4 | 12846.5 | 13190.4 | 13095.7 | 13150.5 | 12823.6 | 11638.2 | 6925.4 |
| 50° | 9861.2 | 9908.5 | 10618.4 | 11959.1 | 13343.5 | 14653.9 | 14604.3 | 14591.7 | 13582.3 | 12064.1 | 7011.2 |
| 52.5° | 8579.6 | 8616.6 | 9202.3 | 10871.3 | 12978.9 | 15462.9 | 15917.7 | 15852.6 | 14256.8 | 12382.9 | 7027.4 |
| 55° | 6628.1 | 6685.8 | 7247.1 | 8700.2 | 11504.4 | 15153.8 | 16883.5 | 16825.0 | 14871.3 | 12550.0 | 7008.2 |
| 57° | 4712.1 | 4772.7 | 5330.3 | 6639.9 | 9677.8 | 14083.7 | 16979.6 | 17041.7 | 15203.3 | 12578.1 | 7029.7 |
| 57.5° | 4204.8 | 4266.9 | 4819.3 | 6091.2 | 9108.4 | 13697.0 | 16896.8 | 17000.3 | 15263.2 | 12573.7 | 7041.5 |
| 60° | 2117.2 | 2140.8 | 2492.8 | 3400.2 | 5757.7 | 11073.2 | 15816.4 | 16083.3 | 15317.2 | 12356.3 | 7092.5 |
| 62.5° | 1316.3 | 1299.3 | 1288.2 | 1566.3 | 2801.2 | 7343.2 | 13586.8 | 14100.7 | 14284.1 | 11829.7 | 6969.0 |
| 65° | 1157.3 | 1125.5 | 1003.5 | 981.3 | 1237.2 | 3566.6 | 10231.7 | 10871.3 | 12076.7 | 11000.0 | 6674.7 |
| 67.5° | 1087.1 | 1056.0 | 918.5 | 835.6 | 836.4 | 1413.9 | 6352.3 | 7072.5 | 9407.9 | 9597.2 | 5980.3 |
| 70° | 1014.6 | 986.5 | 857.8 | 760.2 | 712.1 | 783.1 | 2922.5 | 3469.0 | 6132.6 | 7543.6 | 4998.3 |
| 72.5° | 921.4 | 902.2 | 780.2 | 679.6 | 628.6 | 586.4 | 1118.9 | 1321.5 | 3550.3 | 5066.3 | 3471.2 |
| 75° | 823.8 | 806.1 | 701.8 | 605.6 | 543.5 | 461.4 | 630.1 | 678.9 | 1803.6 | 2591.9 | 1709.0 |
| 77.5° | 716.6 | 706.2 | 624.1 | 535.4 | 485.8 | 382.3 | 445.9 | 469.6 | 773.5 | 1111.5 | 857.1 |
| 80° | 570.2 | 590.1 | 545.7 | 477.0 | 431.1 | 306.2 | 315.8 | 331.3 | 450.4 | 542.8 | 486.6 |
| 82.5° | 371.2 | 406.0 | 427.4 | 387.5 | 355.0 | 241.1 | 227.0 | 233.7 | 293.6 | 331.3 | 211.5 |
| 85° | 154.6 | 173.8 | 281.0 | 253.6 | 235.9 | 176.0 | 152.3 | 155.3 | 181.9 | 188.6 | 86.5 |
| 87.5° | 68.8 | 73.2 | 123.5 | 116.1 | 99.8 | 60.6 | 65.1 | 71.0 | 96.9 | 91.7 | 33.3 |
| 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: P321088
 CATALOG NUMBER: GLEON-SA4C-827-U-AFL

CANDELA DISTRIBUTION (continued):

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0° | 4772.7 | 4772.7 | 4772.7 | 4772.7 | 4772.7 | 4772.7 | 4772.7 | 4772.7 | 4772.7 | 4772.7 | 4772.7 |
| 2.5° | 4777.1 | 4715.0 | 4608.5 | 4491.0 | 4394.8 | 4317.9 | 4240.3 | 4187.0 | 4124.9 | 4091.6 | 4074.6 |
| 5° | 4780.8 | 4658.8 | 4434.8 | 4204.8 | 3999.2 | 3811.4 | 3632.4 | 3494.9 | 3366.2 | 3296.7 | 3277.4 |
| 7.5° | 4796.4 | 4613.0 | 4250.6 | 3872.0 | 3506.7 | 3173.2 | 2915.8 | 2754.6 | 2638.5 | 2586.8 | 2572.0 |
| 10° | 4808.9 | 4559.0 | 4022.9 | 3462.3 | 2965.4 | 2627.4 | 2427.8 | 2337.5 | 2297.6 | 2291.0 | 2284.3 |
| 12.5° | 4838.5 | 4503.5 | 3783.3 | 3034.9 | 2544.6 | 2310.9 | 2241.4 | 2235.5 | 2246.6 | 2262.9 | 2262.9 |
| 15° | 4885.1 | 4448.8 | 3509.7 | 2668.1 | 2276.9 | 2194.8 | 2208.9 | 2241.4 | 2271.7 | 2296.9 | 2300.6 |
| 17.5° | 4919.1 | 4381.5 | 3215.3 | 2374.5 | 2134.2 | 2156.4 | 2206.7 | 2252.5 | 2283.6 | 2308.0 | 2310.2 |
| 20° | 4943.5 | 4277.2 | 2901.0 | 2150.5 | 2052.1 | 2120.9 | 2183.7 | 2224.4 | 2245.9 | 2270.3 | 2274.0 |
| 22.5° | 4931.0 | 4137.5 | 2622.3 | 1990.0 | 1985.5 | 2069.1 | 2129.0 | 2177.8 | 2161.5 | 2137.9 | 2153.4 |
| 25° | 4870.3 | 3945.2 | 2335.3 | 1870.2 | 1915.3 | 1999.6 | 2073.5 | 2041.0 | 1986.3 | 1975.9 | 1981.9 |
| 27.5° | 4762.4 | 3699.7 | 2069.9 | 1759.3 | 1834.0 | 1935.3 | 1930.8 | 1898.3 | 1879.1 | 1865.8 | 1873.9 |
| 30° | 4646.3 | 3433.5 | 1837.6 | 1662.4 | 1743.7 | 1827.3 | 1810.3 | 1809.5 | 1790.3 | 1768.9 | 1779.2 |
| 32.5° | 4531.6 | 3165.8 | 1653.5 | 1582.5 | 1675.7 | 1686.8 | 1723.8 | 1734.9 | 1697.1 | 1652.0 | 1649.1 |
| 35° | 4431.8 | 2912.9 | 1513.7 | 1510.1 | 1593.6 | 1595.1 | 1649.1 | 1633.5 | 1539.6 | 1493.0 | 1493.0 |
| 37.5° | 4357.1 | 2660.7 | 1407.3 | 1445.0 | 1485.6 | 1524.1 | 1551.5 | 1487.1 | 1471.6 | 1445.7 | 1445.0 |
| 40° | 4324.6 | 2438.9 | 1340.7 | 1395.4 | 1409.5 | 1458.3 | 1388.0 | 1413.2 | 1420.6 | 1407.3 | 1407.3 |
| 42.5° | 4290.6 | 2245.9 | 1283.0 | 1357.7 | 1355.5 | 1348.8 | 1313.3 | 1345.9 | 1375.5 | 1376.2 | 1374.0 |
| 45° | 4256.5 | 2079.5 | 1232.0 | 1277.1 | 1308.2 | 1236.4 | 1243.1 | 1277.9 | 1319.3 | 1334.1 | 1334.1 |
| 47.5° | 4218.8 | 1947.8 | 1185.4 | 1192.1 | 1240.1 | 1192.1 | 1186.9 | 1213.5 | 1262.3 | 1286.0 | 1291.2 |
| 50° | 4136.0 | 1829.5 | 1132.2 | 1117.4 | 1130.7 | 1147.0 | 1151.4 | 1164.0 | 1218.0 | 1255.7 | 1264.5 |
| 52.5° | 4021.4 | 1723.8 | 1064.1 | 1048.6 | 1048.6 | 1110.0 | 1130.7 | 1134.4 | 1180.2 | 1225.3 | 1234.2 |
| 55° | 3926.0 | 1656.5 | 993.9 | 990.9 | 988.0 | 1070.8 | 1106.3 | 1112.2 | 1144.0 | 1179.5 | 1183.9 |
| 57° | 3932.6 | 1651.3 | 939.9 | 942.9 | 942.1 | 1030.9 | 1083.4 | 1095.9 | 1112.2 | 1142.5 | 1147.7 |
| 57.5° | 3936.3 | 1655.0 | 928.1 | 929.5 | 928.8 | 1019.8 | 1076.7 | 1090.8 | 1103.3 | 1135.1 | 1140.3 |
| 60° | 3991.8 | 1664.6 | 880.0 | 863.7 | 867.4 | 960.6 | 1039.0 | 1056.7 | 1064.9 | 1107.0 | 1113.7 |
| 62.5° | 3909.7 | 1621.7 | 841.5 | 802.4 | 802.4 | 898.5 | 986.5 | 1014.6 | 1027.2 | 1084.1 | 1095.2 |
| 65° | 3671.6 | 1501.2 | 796.4 | 732.8 | 740.2 | 836.4 | 923.6 | 969.5 | 988.7 | 1059.7 | 1071.5 |
| 67.5° | 3304.1 | 1361.4 | 748.4 | 670.7 | 678.1 | 771.3 | 858.6 | 908.1 | 938.4 | 1033.1 | 1042.7 |
| 70° | 2825.6 | 1190.6 | 683.3 | 604.9 | 613.8 | 700.3 | 781.6 | 837.8 | 883.0 | 1007.9 | 1010.9 |
| 72.5° | 2083.2 | 976.1 | 592.3 | 532.4 | 542.1 | 617.5 | 704.0 | 769.1 | 829.7 | 945.1 | 943.6 |
| 75° | 1238.7 | 763.2 | 491.8 | 459.2 | 465.9 | 536.1 | 633.7 | 712.9 | 803.8 | 920.7 | 934.7 |
| 77.5° | 751.3 | 574.6 | 400.8 | 384.5 | 392.7 | 464.4 | 583.5 | 667.8 | 792.7 | 868.2 | 863.7 |
| 80° | 454.1 | 410.4 | 320.2 | 309.8 | 318.0 | 397.1 | 539.8 | 633.7 | 692.9 | 741.7 | 741.7 |
| 82.5° | 237.4 | 250.7 | 235.2 | 227.0 | 238.1 | 322.4 | 491.0 | 553.1 | 612.3 | 525.8 | 491.0 |
| 85° | 96.9 | 130.9 | 142.7 | 142.0 | 148.6 | 223.3 | 423.7 | 473.3 | 394.9 | 374.9 | 383.8 |
| 87.5° | 32.5 | 55.5 | 69.5 | 59.9 | 62.9 | 140.5 | 293.6 | 228.5 | 271.4 | 189.3 | 179.7 |
| 90° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

Cooper Lighting Solutions Photometric Lab
1121 Highway 74 South
Peachtree City, GA 30269



LM-79-2019: Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Report Prepared for

Cooper Lighting Solutions

Invue

Report Number: SP1-2407-157-9

Test Date: 10/03/2024

Luminaire Tested: EMM2-HTN-SA1A-827-U-5WQ

Data applicable to all product families utilizing light square engine

Test Information

Test Method: LM-79-2019
 Report Number: SP1-2407-157-9
 Test Lab: COOPER LIGHTING SOLUTIONS
 Photometer: SP1 - 76IN SPHERE
 Measurement Geometry: 4π
 Issue Date: 10/03/2024
 Manufacturer: COOPER LIGHTING SOLUTIONS
 Product Line: Invue
 Catalog Number: **EMM2-HTN-SA1A-827-U-5WQ**
 Description: Epic Modern Light Square 40W 5WQ Optic

Spectral Parameters

CCT (K): 2764
 CIE u': 0.2591
 CIE v': 0.5290
 Duv: 0.0020
 CIE x: 0.4581
 CIE y: 0.4156
 CIE z: 0.1263
 Peak Wavelength (nm): 603
 Dominant Wavelength (nm): 583
 Purity: 62.2537
 Rf: 84.7
 Rg: 94.6

| | | | |
|-----------|------|------|------|
| CRI (Ra): | 80.9 | | |
| R1: | 78.8 | R9: | -1.5 |
| R2: | 89.9 | R10: | 77.9 |
| R3: | 96.2 | R11: | 78.9 |
| R4: | 79.1 | R12: | 71.6 |
| R5: | 79.1 | R13: | 81.2 |
| R6: | 88.8 | R14: | 98.5 |
| R7: | 81.3 | R15: | 69.9 |
| R8: | 54.3 | | |



Test Conditions

Stabilization Time: 81M
 Operation Time: 2H 21M
 Sphere Temperature (°C): 25.2

REPORT NUMBER: SP1-2407-157-9

| Measurement and Test Equipment | | | |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument | Identification Number | Calibration Date | Calibration Due Date |
| Photometer | IN0058 | 6/18/2024 | 12/18/2024 |
| Power Meter | INXT2011004 | 2/8/2024 | 2/8/2025 |
| AC Power Source | IN0063 | 10/24/2023 | 10/24/2024 |
| DC Power Source | IN0208 | 10/24/2023 | 10/24/2024 |
| Sphere Thermometer | IN0085 | 10/24/2023 | 10/24/2024 |
| Room Thermometer | IN0046 | 10/24/2023 | 10/24/2024 |

REPORT NUMBER: SP1-2407-157-9

CIE 1931 Chromaticity Diagram



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



CCT = 2764K
 CIE x = 0.4581
 CIE y = 0.4156
 Duv = 0.0020

Point lies inside the ANSI 2700K 4-step quadrangle

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Photopic Flux vs. Wavelength



Photopic Lumens: 4337.9

| λ (nm) | Power ($\mu\text{W}/\text{nm}$) | Lumens (ϕ/nm) | λ (nm) | Power ($\mu\text{W}/\text{nm}$) | Lumens (ϕ/nm) | λ (nm) | Power ($\mu\text{W}/\text{nm}$) | Lumens (ϕ/nm) | λ (nm) | Power ($\mu\text{W}/\text{nm}$) | Lumens (ϕ/nm) | λ (nm) | Power ($\mu\text{W}/\text{nm}$) | Lumens (ϕ/nm) |
|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|
| 360 | 0 | 0.0 | 490 | 18018 | 2.6 | 620 | 87426 | 22.8 | 750 | 2680 | 0.0 | 880 | 58 | 0.0 |
| 365 | 0 | 0.0 | 495 | 22295 | 3.9 | 625 | 83013 | 18.2 | 755 | 2287 | 0.0 | 885 | 46 | 0.0 |
| 370 | 0 | 0.0 | 500 | 26478 | 5.8 | 630 | 78077 | 14.1 | 760 | 1944 | 0.0 | 890 | 45 | 0.0 |
| 375 | 0 | 0.0 | 505 | 30524 | 8.5 | 635 | 72080 | 10.7 | 765 | 1653 | 0.0 | 895 | 41 | 0.0 |
| 380 | 0 | 0.0 | 510 | 33611 | 11.5 | 640 | 66249 | 7.9 | 770 | 1413 | 0.0 | 900 | 38 | 0.0 |
| 385 | 0 | 0.0 | 515 | 36490 | 15.2 | 645 | 59973 | 5.7 | 775 | 1198 | 0.0 | 905 | 33 | 0.0 |
| 390 | 0 | 0.0 | 520 | 38610 | 18.7 | 650 | 53972 | 3.9 | 780 | 1025 | 0.0 | 910 | 30 | 0.0 |
| 395 | 0 | 0.0 | 525 | 40511 | 21.9 | 655 | 48369 | 2.7 | 785 | 874 | 0.0 | 915 | 23 | 0.0 |
| 400 | 48 | 0.0 | 530 | 42223 | 24.9 | 660 | 42641 | 1.8 | 790 | 747 | 0.0 | 920 | 24 | 0.0 |
| 405 | 201 | 0.0 | 535 | 44137 | 27.6 | 665 | 37602 | 1.1 | 795 | 639 | 0.0 | 925 | 22 | 0.0 |
| 410 | 457 | 0.0 | 540 | 46032 | 30.0 | 670 | 32798 | 0.7 | 800 | 547 | 0.0 | 930 | 22 | 0.0 |
| 415 | 925 | 0.0 | 545 | 48553 | 32.5 | 675 | 28558 | 0.5 | 805 | 473 | 0.0 | 935 | 17 | 0.0 |
| 420 | 1816 | 0.0 | 550 | 51408 | 34.9 | 680 | 24782 | 0.3 | 810 | 401 | 0.0 | 940 | 13 | 0.0 |
| 425 | 3217 | 0.0 | 555 | 54711 | 37.4 | 685 | 21386 | 0.2 | 815 | 351 | 0.0 | 945 | 6 | 0.0 |
| 430 | 5520 | 0.0 | 560 | 58847 | 40.0 | 690 | 18413 | 0.1 | 820 | 307 | 0.0 | 950 | 10 | 0.0 |
| 435 | 9225 | 0.1 | 565 | 63386 | 42.4 | 695 | 15721 | 0.1 | 825 | 261 | 0.0 | 955 | 11 | 0.0 |
| 440 | 15522 | 0.2 | 570 | 68196 | 44.3 | 700 | 13432 | 0.0 | 830 | 228 | 0.0 | 960 | 8 | 0.0 |
| 445 | 27642 | 0.6 | 575 | 73613 | 46.0 | 705 | 11513 | 0.0 | 835 | 193 | 0.0 | 965 | 12 | 0.0 |
| 450 | 36602 | 0.9 | 580 | 79207 | 47.1 | 710 | 9780 | 0.0 | 840 | 174 | 0.0 | 970 | 3 | 0.0 |
| 455 | 28292 | 0.9 | 585 | 84248 | 47.0 | 715 | 8356 | 0.0 | 845 | 151 | 0.0 | 975 | 8 | 0.0 |
| 460 | 21166 | 0.9 | 590 | 88397 | 45.7 | 720 | 7161 | 0.0 | 850 | 123 | 0.0 | 980 | 2 | 0.0 |
| 465 | 19092 | 1.0 | 595 | 91428 | 43.4 | 725 | 6067 | 0.0 | 855 | 106 | 0.0 | 985 | 13 | 0.0 |
| 470 | 14951 | 0.9 | 600 | 93452 | 40.3 | 730 | 5164 | 0.0 | 860 | 95 | 0.0 | 990 | 16 | 0.0 |
| 475 | 12606 | 1.0 | 605 | 93959 | 36.4 | 735 | 4393 | 0.0 | 865 | 82 | 0.0 | 995 | 20 | 0.0 |
| 480 | 13323 | 1.3 | 610 | 93079 | 32.0 | 740 | 3694 | 0.0 | 870 | 77 | 0.0 | 1000 | 0 | 0.0 |
| 485 | 15164 | 1.8 | 615 | 90707 | 27.3 | 745 | 3157 | 0.0 | 875 | 65 | 0.0 | | | |

REPORT NUMBER: SP1-2407-157-9

Scotopic Flux vs. Wavelength



Scotopic Lumens: 5286.7

S/P: 1.22

| λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) |
|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|
| 360 | 0 | 0.0 | 490 | 18018 | 75.9 | 620 | 87426 | 0.4 | 750 | 2680 | 0.0 | 880 | 58 | 0.0 |
| 365 | 0 | 0.0 | 495 | 22295 | 93.2 | 625 | 83013 | 0.2 | 755 | 2287 | 0.0 | 885 | 46 | 0.0 |
| 370 | 0 | 0.0 | 500 | 26478 | 107.8 | 630 | 78077 | 0.1 | 760 | 1944 | 0.0 | 890 | 45 | 0.0 |
| 375 | 0 | 0.0 | 505 | 30524 | 118.7 | 635 | 72080 | 0.1 | 765 | 1653 | 0.0 | 895 | 41 | 0.0 |
| 380 | 0 | 0.0 | 510 | 33611 | 122.2 | 640 | 66249 | 0.1 | 770 | 1413 | 0.0 | 900 | 38 | 0.0 |
| 385 | 0 | 0.0 | 515 | 36490 | 120.8 | 645 | 59973 | 0.0 | 775 | 1198 | 0.0 | 905 | 33 | 0.0 |
| 390 | 0 | 0.0 | 520 | 38610 | 113.9 | 650 | 53972 | 0.0 | 780 | 1025 | 0.0 | 910 | 30 | 0.0 |
| 395 | 0 | 0.0 | 525 | 40511 | 104.1 | 655 | 48369 | 0.0 | 785 | 874 | 0.0 | 915 | 23 | 0.0 |
| 400 | 48 | 0.0 | 530 | 42223 | 92.4 | 660 | 42641 | 0.0 | 790 | 747 | 0.0 | 920 | 24 | 0.0 |
| 405 | 201 | 0.0 | 535 | 44137 | 80.5 | 665 | 37602 | 0.0 | 795 | 639 | 0.0 | 925 | 22 | 0.0 |
| 410 | 457 | 0.1 | 540 | 46032 | 68.2 | 670 | 32798 | 0.0 | 800 | 547 | 0.0 | 930 | 22 | 0.0 |
| 415 | 925 | 0.3 | 545 | 48553 | 57.1 | 675 | 28558 | 0.0 | 805 | 473 | 0.0 | 935 | 17 | 0.0 |
| 420 | 1816 | 1.1 | 550 | 51408 | 46.7 | 680 | 24782 | 0.0 | 810 | 401 | 0.0 | 940 | 13 | 0.0 |
| 425 | 3217 | 2.5 | 555 | 54711 | 37.4 | 685 | 21386 | 0.0 | 815 | 351 | 0.0 | 945 | 6 | 0.0 |
| 430 | 5520 | 5.9 | 560 | 58847 | 29.4 | 690 | 18413 | 0.0 | 820 | 307 | 0.0 | 950 | 10 | 0.0 |
| 435 | 9225 | 12.5 | 565 | 63386 | 22.5 | 695 | 15721 | 0.0 | 825 | 261 | 0.0 | 955 | 11 | 0.0 |
| 440 | 15522 | 26.3 | 570 | 68196 | 16.9 | 700 | 13432 | 0.0 | 830 | 228 | 0.0 | 960 | 8 | 0.0 |
| 445 | 27642 | 55.2 | 575 | 73613 | 12.4 | 705 | 11513 | 0.0 | 835 | 193 | 0.0 | 965 | 12 | 0.0 |
| 450 | 36602 | 85.4 | 580 | 79207 | 9.0 | 710 | 9780 | 0.0 | 840 | 174 | 0.0 | 970 | 3 | 0.0 |
| 455 | 28292 | 75.1 | 585 | 84248 | 6.3 | 715 | 8356 | 0.0 | 845 | 151 | 0.0 | 975 | 8 | 0.0 |
| 460 | 21166 | 63.2 | 590 | 88397 | 4.4 | 720 | 7161 | 0.0 | 850 | 123 | 0.0 | 980 | 2 | 0.0 |
| 465 | 19092 | 63.2 | 595 | 91428 | 3.0 | 725 | 6067 | 0.0 | 855 | 106 | 0.0 | 985 | 13 | 0.0 |
| 470 | 14951 | 54.2 | 600 | 93452 | 2.0 | 730 | 5164 | 0.0 | 860 | 95 | 0.0 | 990 | 16 | 0.0 |
| 475 | 12606 | 48.8 | 605 | 93959 | 1.3 | 735 | 4393 | 0.0 | 865 | 82 | 0.0 | 995 | 20 | 0.0 |
| 480 | 13323 | 54.2 | 610 | 93079 | 0.9 | 740 | 3694 | 0.0 | 870 | 77 | 0.0 | 1000 | 0 | 0.0 |
| 485 | 15164 | 63.3 | 615 | 90707 | 0.5 | 745 | 3157 | 0.0 | 875 | 65 | 0.0 | | | |

REPORT NUMBER: SP1-2407-157-9

Melanopic Flux vs. Wavelength



Melanopic Lumens: 9797

M/P: 2.26

| λ (nm) | Power ($\mu\text{W}/\text{nm}$) | Lumens (ϕ/nm) | λ (nm) | Power ($\mu\text{W}/\text{nm}$) | Lumens (ϕ/nm) | λ (nm) | Power ($\mu\text{W}/\text{nm}$) | Lumens (ϕ/nm) | λ (nm) | Power ($\mu\text{W}/\text{nm}$) | Lumens (ϕ/nm) | λ (nm) | Power ($\mu\text{W}/\text{nm}$) | Lumens (ϕ/nm) |
|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|
| 360 | 0 | 0.0 | 490 | 18018 | 27.7 | 620 | 87426 | 1.1 | 750 | 2680 | 0.0 | 880 | 58 | 0.0 |
| 365 | 0 | 0.0 | 495 | 22295 | 36.0 | 625 | 83013 | 0.7 | 755 | 2287 | 0.0 | 885 | 46 | 0.0 |
| 370 | 0 | 0.0 | 500 | 26478 | 44.2 | 630 | 78077 | 0.4 | 760 | 1944 | 0.0 | 890 | 45 | 0.0 |
| 375 | 0 | 0.0 | 505 | 30524 | 51.8 | 635 | 72080 | 0.3 | 765 | 1653 | 0.0 | 895 | 41 | 0.0 |
| 380 | 0 | 0.0 | 510 | 33611 | 57.0 | 640 | 66249 | 0.2 | 770 | 1413 | 0.0 | 900 | 38 | 0.0 |
| 385 | 0 | 0.0 | 515 | 36490 | 60.5 | 645 | 59973 | 0.1 | 775 | 1198 | 0.0 | 905 | 33 | 0.0 |
| 390 | 0 | 0.0 | 520 | 38610 | 61.4 | 650 | 53972 | 0.1 | 780 | 1025 | 0.0 | 910 | 30 | 0.0 |
| 395 | 0 | 0.0 | 525 | 40511 | 60.6 | 655 | 48369 | 0.0 | 785 | 874 | 0.0 | 915 | 23 | 0.0 |
| 400 | 48 | 0.0 | 530 | 42223 | 58.2 | 660 | 42641 | 0.0 | 790 | 747 | 0.0 | 920 | 24 | 0.0 |
| 405 | 201 | 0.0 | 535 | 44137 | 55.0 | 665 | 37602 | 0.0 | 795 | 639 | 0.0 | 925 | 22 | 0.0 |
| 410 | 457 | 0.0 | 540 | 46032 | 50.9 | 670 | 32798 | 0.0 | 800 | 547 | 0.0 | 930 | 22 | 0.0 |
| 415 | 925 | 0.1 | 545 | 48553 | 46.6 | 675 | 28558 | 0.0 | 805 | 473 | 0.0 | 935 | 17 | 0.0 |
| 420 | 1816 | 0.3 | 550 | 51408 | 42.0 | 680 | 24782 | 0.0 | 810 | 401 | 0.0 | 940 | 13 | 0.0 |
| 425 | 3217 | 0.8 | 555 | 54711 | 37.4 | 685 | 21386 | 0.0 | 815 | 351 | 0.0 | 945 | 6 | 0.0 |
| 430 | 5520 | 1.9 | 560 | 58847 | 32.9 | 690 | 18413 | 0.0 | 820 | 307 | 0.0 | 950 | 10 | 0.0 |
| 435 | 9225 | 4.1 | 565 | 63386 | 28.4 | 695 | 15721 | 0.0 | 825 | 261 | 0.0 | 955 | 11 | 0.0 |
| 440 | 15522 | 8.7 | 570 | 68196 | 24.1 | 700 | 13432 | 0.0 | 830 | 228 | 0.0 | 960 | 8 | 0.0 |
| 445 | 27642 | 18.5 | 575 | 73613 | 20.0 | 705 | 11513 | 0.0 | 835 | 193 | 0.0 | 965 | 12 | 0.0 |
| 450 | 36602 | 28.3 | 580 | 79207 | 16.3 | 710 | 9780 | 0.0 | 840 | 174 | 0.0 | 970 | 3 | 0.0 |
| 455 | 28292 | 24.7 | 585 | 84248 | 12.9 | 715 | 8356 | 0.0 | 845 | 151 | 0.0 | 975 | 8 | 0.0 |
| 460 | 21166 | 20.4 | 590 | 88397 | 9.8 | 720 | 7161 | 0.0 | 850 | 123 | 0.0 | 980 | 2 | 0.0 |
| 465 | 19092 | 20.1 | 595 | 91428 | 7.3 | 725 | 6067 | 0.0 | 855 | 106 | 0.0 | 985 | 13 | 0.0 |
| 470 | 14951 | 17.2 | 600 | 93452 | 5.3 | 730 | 5164 | 0.0 | 860 | 95 | 0.0 | 990 | 16 | 0.0 |
| 475 | 12606 | 15.7 | 605 | 93959 | 3.7 | 735 | 4393 | 0.0 | 865 | 82 | 0.0 | 995 | 20 | 0.0 |
| 480 | 13323 | 18.0 | 610 | 93079 | 2.5 | 740 | 3694 | 0.0 | 870 | 77 | 0.0 | 1000 | 0 | 0.0 |
| 485 | 15164 | 21.9 | 615 | 90707 | 1.7 | 745 | 3157 | 0.0 | 875 | 65 | 0.0 | | | |

Summary

$R_f = 84.7$
 $R_g = 94.6$
 CIE $R_a = 80.9$
 $R_g = -1.5$



Color Vector Graphics



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

| | | | |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 84 | CES51 = 95 | CES76 = 81 |
| CES02 = 63 | CES27 = 95 | CES52 = 94 | CES77 = 84 |
| CES03 = 31 | CES28 = 94 | CES53 = 89 | CES78 = 81 |
| CES04 = 71 | CES29 = 87 | CES54 = 91 | CES79 = 89 |
| CES05 = 50 | CES30 = 94 | CES55 = 90 | CES80 = 89 |
| CES06 = 52 | CES31 = 89 | CES56 = 86 | CES81 = 69 |
| CES07 = 43 | CES32 = 82 | CES57 = 85 | CES82 = 96 |
| CES08 = 41 | CES33 = 91 | CES58 = 86 | CES83 = 93 |
| CES09 = 29 | CES34 = 92 | CES59 = 91 | CES84 = 92 |
| CES10 = 77 | CES35 = 96 | CES60 = 94 | CES85 = 76 |
| CES11 = 60 | CES36 = 90 | CES61 = 89 | CES86 = 65 |
| CES12 = 66 | CES37 = 96 | CES62 = 94 | CES87 = 84 |
| CES13 = 44 | CES38 = 98 | CES63 = 87 | CES88 = 86 |
| CES14 = 74 | CES39 = 98 | CES64 = 82 | CES89 = 73 |
| CES15 = 72 | CES40 = 95 | CES65 = 78 | CES90 = 88 |
| CES16 = 48 | CES41 = 96 | CES66 = 81 | CES91 = 82 |
| CES17 = 50 | CES42 = 97 | CES67 = 80 | CES92 = 64 |
| CES18 = 57 | CES43 = 91 | CES68 = 83 | CES93 = 78 |
| CES19 = 73 | CES44 = 99 | CES69 = 88 | CES94 = 59 |
| CES20 = 67 | CES45 = 93 | CES70 = 80 | CES95 = 74 |
| CES21 = 87 | CES46 = 89 | CES71 = 79 | CES96 = 83 |
| CES22 = 79 | CES47 = 92 | CES72 = 92 | CES97 = 88 |
| CES23 = 92 | CES48 = 83 | CES73 = 75 | CES98 = 83 |
| CES24 = 91 | CES49 = 90 | CES74 = 91 | CES99 = 74 |
| CES25 = 72 | CES50 = 94 | CES75 = 81 | |



Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)