

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: P1438471

Luminaire Tested: **GALN-SB1C-930-U-T4LG-HSS**

Issue Date: 03/27/202

This test was performed under the Supervised Manufacturer's Testing Program. The results of this test have not been influenced by sources from within Cooper Lighting Solutions or from external interests.

Report Generated By 670245763



**Test Information**

Test Method: LM-79-08  
Report Number: P1438471  
Test Lab: INNOVATION CENTER(G1)  
Issue Date: 03/27/202  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GALN-SB1C-930-U-T4LG-HSS  
Description: GALLEON II AREA AND ROADWAY HIGH DENSITY LUMINAIRE 615mA 1xLight Square PACKAGE 90CRI 3000K FIXTURE w/ TYPE IV LOW GLARE WITH HOUSE SIDE SHIELD  
Light Source: (26) 3000K CCT, 90 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER  
Luminaire Equipment: 

| <u>Sample No.</u> | <u>Condition</u> | <u>Description</u> |
|-------------------|------------------|--------------------|
| a                 | good             | reflector          |
| b                 | good             | lens               |
| c                 | good             | housing            |
| d                 | good             | cord               |

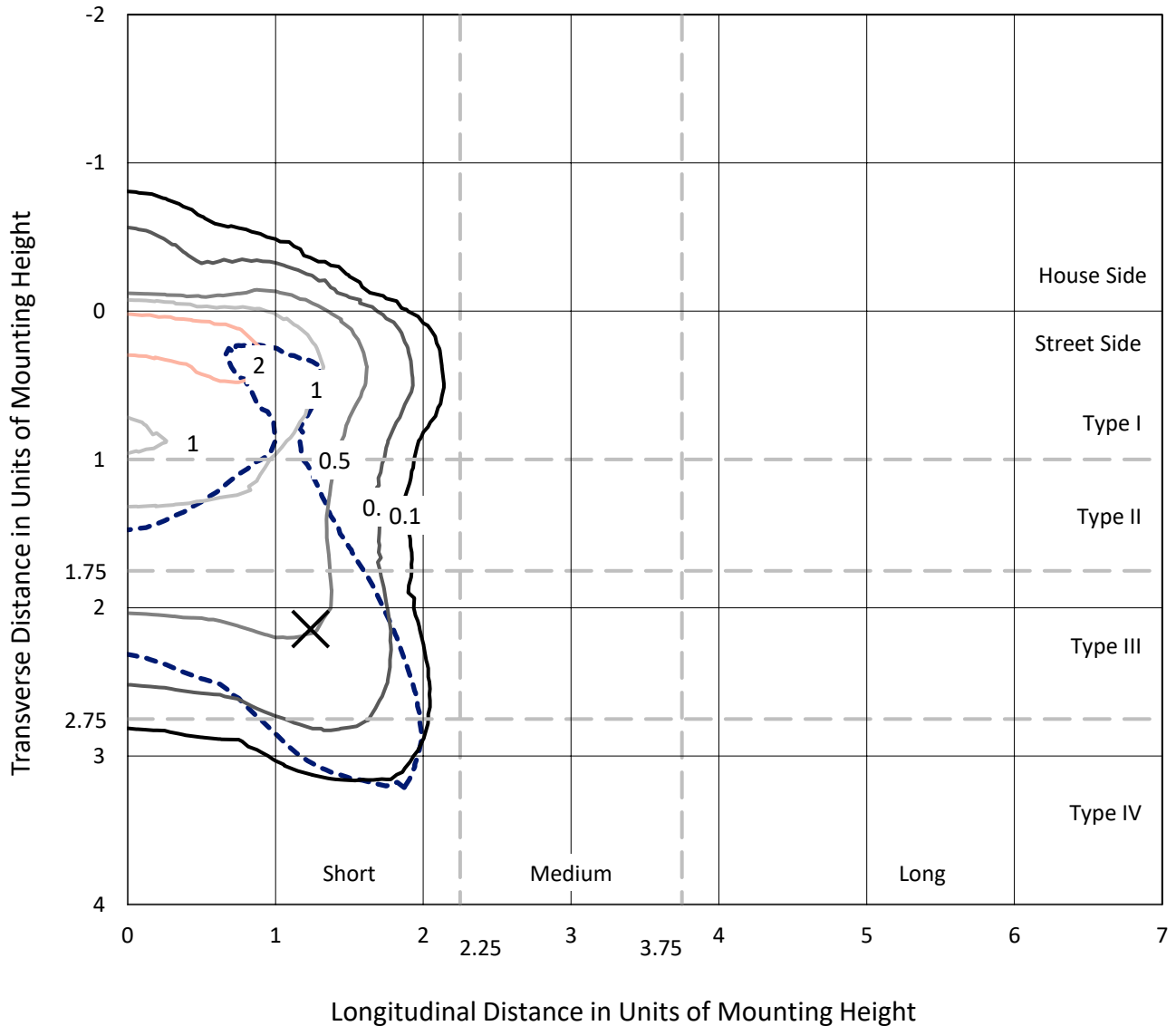
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 3781.7 lumens  
Efficiency: N/A  
Efficacy: 69.5 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 0.5' x H: 0')  
IES Classification: Type IV - Short  
BUG Rating: B0 - U0 - G1  
  
Input Watts (W): 54.4  
Input Voltage (V): 120  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.97  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 28.75 FT

REPORT NUMBER: P1438471  
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### Iso-Footcandle Lines of Horizontal Illumination

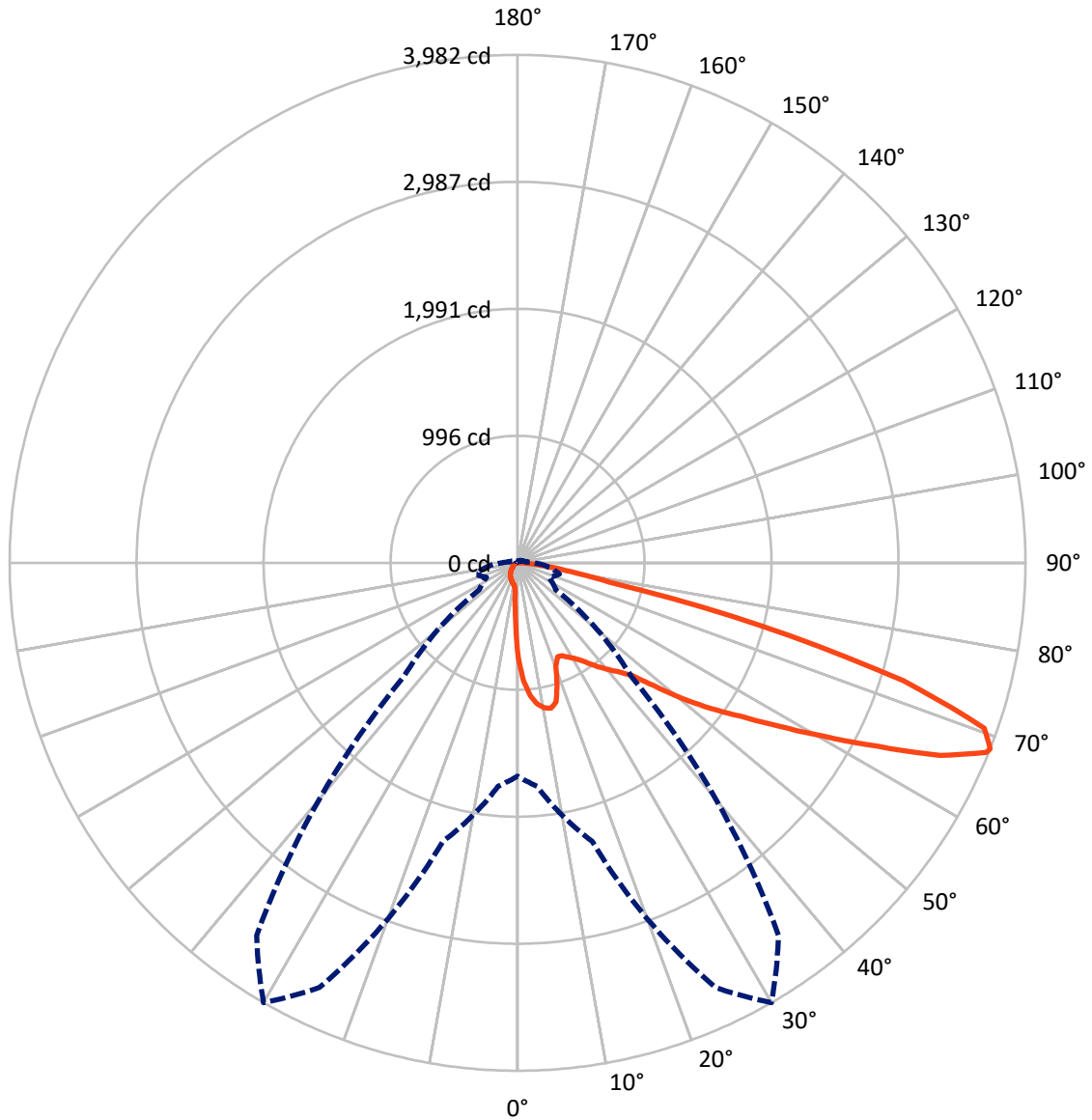
× Max cd  
 - - - 1/2 Max cd



Based on 20 foot mounting height. Maximum calculated value = 2.9 fc  
 Type IV - Short - N/A

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### Luminous Intensity Polar Plot



— Vertical Plane Through 30-Deg Lateral    - - - Horizontal Cone Through 68-Deg Vertical

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**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 288.7    | 0.0    | 288.7  |
|                    | % Fixture | 7.6      | 0.0    | 7.6    |
| <b>Street Side</b> | Lumens    | 3493.1   | 0.0    | 3493.1 |
|                    | % Fixture | 92.4     | 0.0    | 92.4   |
| <b>Total</b>       | Lumens    | 3781.7   | 0.0    | 3781.7 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**Coefficient of Utilization**

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 64.3   | 1.7       |
| 10°-20°   | 183.7  | 4.9       |
| 20°-30°   | 288.7  | 7.6       |
| 30°-40°   | 452.8  | 12.0      |
| 40°-50°   | 676.8  | 17.9      |
| 50°-60°   | 900.3  | 23.8      |
| 60°-70°   | 870.3  | 23.0      |
| 70°-80°   | 312.9  | 8.3       |
| 80°-90°   | 31.9   | 0.8       |
| 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°    | 3781.7 | 100.0     |
| 0°-180°   | 3781.7 | 100.0     |

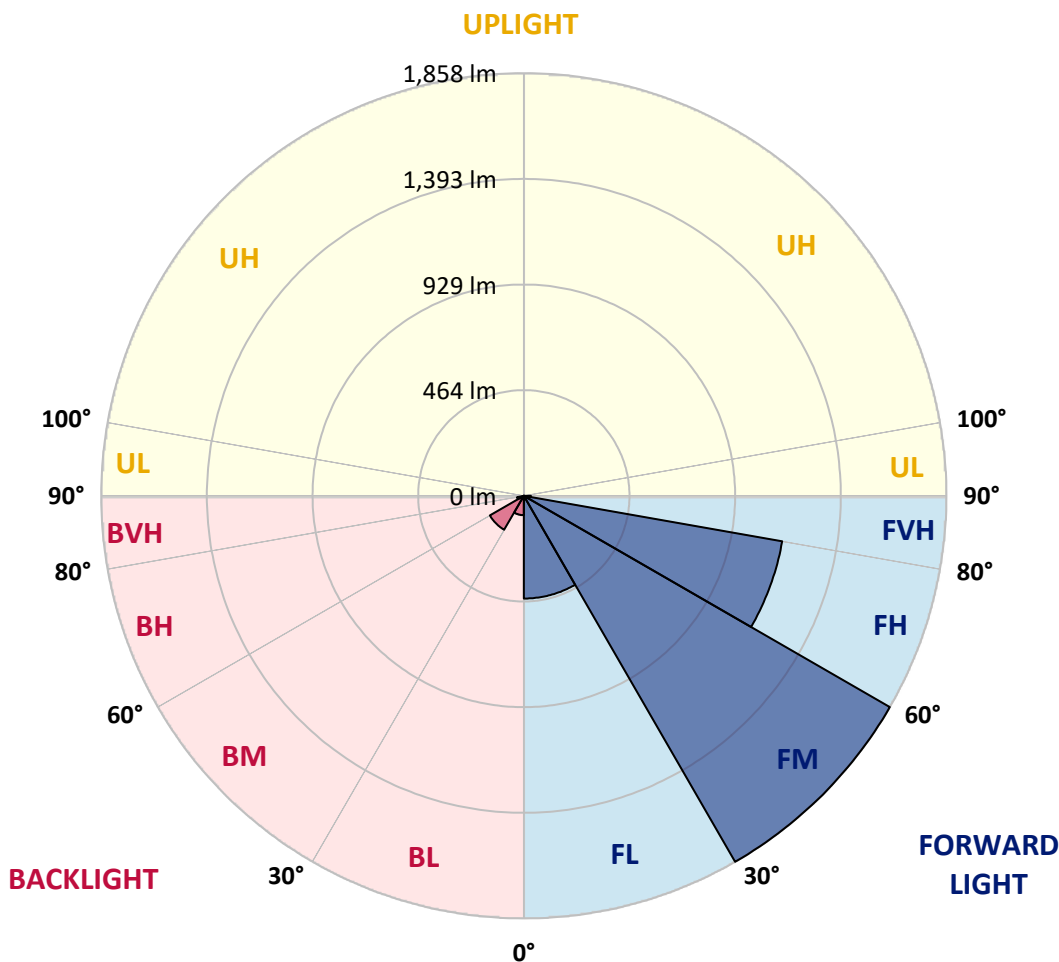


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**LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:**

| Zone           | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|----------------|--------|-----------|-------------------------|------|---------|
|                |        |           | B                       | U    | G       |
| FL (0°-30°)    | 451.5  | 11.9      |                         |      |         |
| FM (30°-60°)   | 1857.6 | 49.1      |                         |      |         |
| FH (60°-80°)   | 1153.2 | 30.5      |                         |      | G1/1800 |
| FVH (80°-90°)  | 30.8   | 0.8       |                         |      | G1/100  |
| BL (0°-30°)    | 85.2   | 2.3       | B0/110                  |      |         |
| BM (30°-60°)   | 172.3  | 4.6       | B0/220                  |      |         |
| BH (60°-80°)   | 30.0   | 0.8       | 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: B0-U0-G1**  
 Type IV Short





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 30°    | 35°    | 45°    | 55°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 745.7  | 745.7  | 745.7  | 745.7  | 745.7  | 745.7  | 745.7  | 745.7  | 745.7  | 745.7  | 745.7  |
| 2.5°  | 953.1  | 953.1  | 946.3  | 937.2  | 927.0  | 923.6  | 904.4  | 877.2  | 848.8  | 816.0  | 768.4  |
| 5°    | 1075.5 | 1074.4 | 1060.8 | 1060.8 | 1047.2 | 1034.7 | 1015.4 | 975.8  | 930.4  | 871.5  | 788.8  |
| 7.5°  | 1129.9 | 1132.2 | 1126.5 | 1126.5 | 1118.6 | 1109.5 | 1098.2 | 1059.6 | 1006.4 | 927.0  | 809.2  |
| 10°   | 1149.2 | 1150.3 | 1150.3 | 1158.2 | 1156.0 | 1154.8 | 1153.7 | 1132.2 | 1076.6 | 983.7  | 830.7  |
| 12.5° | 1102.7 | 1108.4 | 1124.2 | 1159.4 | 1170.7 | 1183.2 | 1200.2 | 1193.4 | 1154.8 | 1055.1 | 863.6  |
| 15°   | 953.1  | 954.2  | 998.4  | 1085.7 | 1132.2 | 1179.8 | 1245.5 | 1259.1 | 1234.2 | 1132.2 | 897.6  |
| 17.5° | 786.5  | 789.9  | 825.0  | 922.5  | 997.3  | 1107.2 | 1271.5 | 1327.1 | 1318.0 | 1208.1 | 929.3  |
| 20°   | 717.4  | 721.9  | 738.9  | 800.1  | 856.8  | 958.8  | 1245.5 | 1391.7 | 1395.1 | 1284.0 | 958.8  |
| 22.5° | 701.5  | 704.9  | 718.5  | 766.1  | 801.2  | 869.2  | 1157.1 | 1442.7 | 1482.3 | 1371.3 | 993.9  |
| 25°   | 697.0  | 700.4  | 720.8  | 772.9  | 805.8  | 862.4  | 1076.6 | 1469.9 | 1585.5 | 1461.9 | 1027.9 |
| 27.5° | 693.6  | 698.1  | 731.0  | 797.8  | 836.4  | 890.8  | 1061.9 | 1475.5 | 1684.1 | 1558.3 | 1083.4 |
| 30°   | 698.1  | 704.9  | 748.0  | 823.9  | 868.1  | 929.3  | 1097.0 | 1481.2 | 1792.9 | 1668.2 | 1153.7 |
| 32.5° | 716.2  | 721.9  | 774.0  | 859.0  | 910.0  | 979.2  | 1157.1 | 1515.2 | 1896.0 | 1780.4 | 1220.6 |
| 35°   | 736.6  | 744.6  | 806.9  | 908.9  | 970.1  | 1048.3 | 1238.7 | 1582.1 | 1994.6 | 1886.9 | 1289.7 |
| 37.5° | 761.6  | 770.6  | 845.4  | 965.6  | 1035.8 | 1124.2 | 1327.1 | 1675.0 | 2081.8 | 1974.2 | 1358.8 |
| 40°   | 795.6  | 805.8  | 889.6  | 1025.6 | 1101.6 | 1190.0 | 1414.3 | 1766.8 | 2148.7 | 2026.3 | 1404.1 |
| 42.5° | 929.3  | 942.9  | 978.0  | 1084.6 | 1169.6 | 1260.2 | 1500.5 | 1854.1 | 2173.6 | 2043.3 | 1413.2 |
| 45°   | 1178.6 | 1192.2 | 1183.2 | 1203.6 | 1260.2 | 1345.2 | 1594.5 | 1937.9 | 2177.0 | 2038.8 | 1408.7 |
| 47.5° | 1429.1 | 1444.9 | 1437.0 | 1425.7 | 1438.1 | 1478.9 | 1699.9 | 1991.2 | 2158.9 | 2036.5 | 1408.7 |
| 50°   | 1668.2 | 1659.1 | 1660.3 | 1656.9 | 1668.2 | 1689.7 | 1801.9 | 2001.4 | 2154.4 | 2058.1 | 1421.1 |
| 52.5° | 1796.3 | 1800.8 | 1829.1 | 1871.1 | 1896.0 | 1917.5 | 1918.7 | 2017.3 | 2121.5 | 2021.8 | 1406.4 |
| 55°   | 1922.1 | 1931.1 | 1996.9 | 2068.2 | 2123.8 | 2164.6 | 2035.4 | 2007.1 | 1925.5 | 1900.5 | 1329.3 |
| 57.5° | 2063.7 | 2076.2 | 2169.1 | 2316.4 | 2413.9 | 2435.4 | 2151.0 | 1816.7 | 1629.7 | 1727.1 | 1179.8 |
| 60°   | 2258.6 | 2273.4 | 2396.9 | 2617.9 | 2763.0 | 2718.8 | 2160.0 | 1514.1 | 1294.2 | 1433.6 | 973.5  |
| 62.5° | 2411.6 | 2441.1 | 2664.4 | 3008.9 | 3168.7 | 3028.1 | 1991.2 | 1160.5 | 904.4  | 1007.5 | 710.6  |
| 65°   | 2248.4 | 2305.1 | 2668.9 | 3456.5 | 3641.3 | 3391.9 | 1726.0 | 792.2  | 510.0  | 651.6  | 454.4  |
| 67.5° | 1817.8 | 1897.1 | 2369.7 | 3674.1 | 3965.4 | 3583.5 | 1358.8 | 420.4  | 292.4  | 378.5  | 239.1  |
| 68°   | 1672.7 | 1758.9 | 2259.8 | 3674.1 | 3982.4 | 3566.5 | 1261.3 | 363.8  | 269.7  | 340.0  | 207.4  |
| 70°   | 1156.0 | 1217.2 | 1737.3 | 3467.9 | 3882.6 | 3251.4 | 830.7  | 208.5  | 202.9  | 233.5  | 137.1  |
| 72.5° | 566.6  | 632.4  | 929.3  | 2748.2 | 3163.0 | 2498.9 | 378.5  | 138.3  | 154.1  | 171.1  | 107.7  |
| 75°   | 225.5  | 239.1  | 366.1  | 1355.4 | 1976.5 | 1594.5 | 198.3  | 104.3  | 132.6  | 133.7  | 85.0   |
| 77.5° | 129.2  | 137.1  | 202.9  | 498.6  | 741.2  | 712.8  | 128.1  | 74.8   | 105.4  | 96.3   | 55.5   |
| 80°   | 72.5   | 73.7   | 114.5  | 262.9  | 423.8  | 379.7  | 87.3   | 54.4   | 80.5   | 68.0   | 37.4   |
| 82.5° | 36.3   | 40.8   | 72.5   | 145.1  | 235.7  | 241.4  | 46.5   | 38.5   | 64.6   | 48.7   | 30.6   |
| 85°   | 26.1   | 28.3   | 52.1   | 80.5   | 108.8  | 163.2  | 28.3   | 19.3   | 48.7   | 32.9   | 21.5   |
| 87.5° | 13.6   | 17.0   | 32.9   | 39.7   | 44.2   | 55.5   | 13.6   | 9.1    | 27.2   | 19.3   | 11.3   |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |



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CATALOG NUMBER: GALN-SB1C-930-U-T4LG-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°   | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 745.7  | 745.7 | 745.7 | 745.7 | 745.7 | 745.7 | 745.7 | 745.7 | 745.7 | 745.7 | 745.7 |
| 2.5°  | 745.7  | 719.6 | 666.4 | 604.0 | 555.3 | 505.4 | 464.6 | 426.1 | 408.0 | 405.7 | 410.3 |
| 5°    | 742.3  | 685.6 | 564.4 | 445.4 | 347.9 | 279.9 | 242.5 | 223.3 | 213.1 | 208.5 | 209.7 |
| 7.5°  | 735.5  | 649.4 | 455.6 | 301.5 | 225.5 | 196.1 | 187.0 | 183.6 | 182.5 | 182.5 | 182.5 |
| 10°   | 728.7  | 600.6 | 349.1 | 221.0 | 184.7 | 176.8 | 174.5 | 174.5 | 173.4 | 173.4 | 174.5 |
| 12.5° | 725.3  | 555.3 | 270.9 | 184.7 | 172.3 | 168.9 | 166.6 | 165.5 | 165.5 | 165.5 | 166.6 |
| 15°   | 717.4  | 505.4 | 218.7 | 171.1 | 164.3 | 159.8 | 158.7 | 157.5 | 157.5 | 157.5 | 157.5 |
| 17.5° | 710.6  | 456.7 | 190.4 | 162.1 | 156.4 | 151.9 | 150.7 | 149.6 | 149.6 | 150.7 | 150.7 |
| 20°   | 700.4  | 410.3 | 171.1 | 153.0 | 148.5 | 143.9 | 142.8 | 141.7 | 142.8 | 142.8 | 142.8 |
| 22.5° | 687.9  | 371.7 | 159.8 | 146.2 | 140.5 | 136.0 | 136.0 | 136.0 | 136.0 | 136.0 | 137.1 |
| 25°   | 680.0  | 344.5 | 151.9 | 138.3 | 132.6 | 129.2 | 128.1 | 128.1 | 130.3 | 130.3 | 131.5 |
| 27.5° | 692.4  | 337.7 | 153.0 | 136.0 | 125.8 | 122.4 | 121.3 | 121.3 | 123.5 | 124.7 | 125.8 |
| 30°   | 729.8  | 350.2 | 166.6 | 142.8 | 121.3 | 115.6 | 114.5 | 114.5 | 117.9 | 119.0 | 120.1 |
| 32.5° | 772.9  | 376.3 | 187.0 | 151.9 | 117.9 | 108.8 | 106.5 | 106.5 | 109.9 | 111.1 | 112.2 |
| 35°   | 831.8  | 417.0 | 214.2 | 159.8 | 120.1 | 102.0 | 97.5  | 97.5  | 99.7  | 102.0 | 103.1 |
| 37.5° | 907.8  | 483.9 | 245.9 | 165.5 | 120.1 | 94.1  | 88.4  | 87.3  | 89.5  | 89.5  | 90.7  |
| 40°   | 987.1  | 571.2 | 278.8 | 165.5 | 114.5 | 86.1  | 80.5  | 77.1  | 78.2  | 77.1  | 78.2  |
| 42.5° | 1031.3 | 641.4 | 307.1 | 155.3 | 107.7 | 78.2  | 72.5  | 68.0  | 66.9  | 64.6  | 65.7  |
| 45°   | 1056.2 | 673.2 | 299.2 | 143.9 | 100.9 | 72.5  | 65.7  | 60.1  | 57.8  | 54.4  | 54.4  |
| 47.5° | 1056.2 | 676.6 | 256.1 | 134.9 | 94.1  | 68.0  | 58.9  | 53.3  | 49.9  | 46.5  | 47.6  |
| 50°   | 1043.8 | 646.0 | 202.9 | 125.8 | 86.1  | 63.5  | 53.3  | 48.7  | 44.2  | 41.9  | 41.9  |
| 52.5° | 991.6  | 546.2 | 155.3 | 114.5 | 77.1  | 57.8  | 47.6  | 43.1  | 38.5  | 37.4  | 37.4  |
| 55°   | 902.1  | 401.2 | 125.8 | 103.1 | 69.1  | 53.3  | 43.1  | 39.7  | 35.1  | 32.9  | 32.9  |
| 57.5° | 733.2  | 274.3 | 104.3 | 92.9  | 61.2  | 47.6  | 38.5  | 35.1  | 29.5  | 27.2  | 27.2  |
| 60°   | 544.0  | 179.1 | 88.4  | 81.6  | 52.1  | 43.1  | 34.0  | 29.5  | 24.9  | 22.7  | 21.5  |
| 62.5° | 367.2  | 121.3 | 73.7  | 64.6  | 44.2  | 37.4  | 29.5  | 24.9  | 19.3  | 14.7  | 14.7  |
| 65°   | 228.9  | 94.1  | 61.2  | 51.0  | 38.5  | 32.9  | 24.9  | 19.3  | 13.6  | 10.2  | 9.1   |
| 67.5° | 131.5  | 75.9  | 49.9  | 39.7  | 32.9  | 26.1  | 19.3  | 15.9  | 11.3  | 7.9   | 6.8   |
| 68°   | 121.3  | 72.5  | 46.5  | 37.4  | 30.6  | 24.9  | 18.1  | 14.7  | 10.2  | 6.8   | 6.8   |
| 70°   | 98.6   | 64.6  | 39.7  | 30.6  | 26.1  | 20.4  | 15.9  | 12.5  | 7.9   | 4.5   | 4.5   |
| 72.5° | 87.3   | 54.4  | 34.0  | 23.8  | 18.1  | 17.0  | 12.5  | 9.1   | 5.7   | 3.4   | 2.3   |
| 75°   | 71.4   | 43.1  | 27.2  | 18.1  | 12.5  | 12.5  | 9.1   | 5.7   | 2.3   | 0.0   | 0.0   |
| 77.5° | 46.5   | 31.7  | 21.5  | 11.3  | 6.8   | 7.9   | 5.7   | 2.3   | 0.0   | 0.0   | 0.0   |
| 80°   | 30.6   | 23.8  | 14.7  | 5.7   | 3.4   | 3.4   | 1.1   | 0.0   | 0.0   | 0.0   | 0.0   |
| 82.5° | 21.5   | 15.9  | 9.1   | 2.3   | 1.1   | 1.1   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 85°   | 13.6   | 6.8   | 3.4   | 1.1   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 87.5° | 5.7    | 2.3   | 1.1   | 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   |

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



LM-79-08: Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Report Prepared for

Cooper Lighting Solutions

(formerly Eaton)

McGRAW-EDISON

Report Number: SP1-2106-271-2

Luminaire Tested: GFLD-SA1-A-930-U-WR-X-BK

Test Date: 06/16/2021

**Test Information**

Test Method: LM-79-08  
 Report Number: SP1-2106-271-2  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1  
 Measurement Geometry: 4π  
 Issue Date: 06/16/2021  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: MCGRAW-EDISON  
 Catalog Number: **GFLD-SA1-A-930-U-WR-X-BK**  
 Description: MCGRAW EDISON

N6, BLACK

**Spectral Parameters**

CCT (K): 3038  
 CIE u': 0.2481  
 CIE v': 0.5247  
 Duv: 0.0030  
 CIE x: 0.4384  
 CIE y: 0.4121  
 CIE z: 0.1495  
 Peak Wavelength (nm): 624  
 Dominant Wavelength (nm): 581  
 Purity: 55.6  
 Rf: 92.8  
 Rg: 98

|           |      |      |      |
|-----------|------|------|------|
| CRI (Ra): | 92.3 |      |      |
| R1:       | 92.0 | R9:  | 58.9 |
| R2:       | 94.8 | R10: | 87.0 |
| R3:       | 96.7 | R11: | 93.2 |
| R4:       | 93.0 | R12: | 81.1 |
| R5:       | 91.4 | R13: | 92.5 |
| R6:       | 93.7 | R14: | 97.4 |
| R7:       | 93.9 |      |      |
| R8:       | 82.9 |      |      |

**Test Conditions**  
 Stabilization Time: 82M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 24.3/43%  
 Sphere Temperature (°C): 24.2



REPORT NUMBER: SP1-2106-271-2

| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | 76INCH SPHERE IN0058  | 1/31/2021        | 7/31/2021            |
| Power Meter                    | XITRON 2801 IN0071    | 12/1/2020        | 12/1/2021            |
| AC Power Source                | CHROMA 61603 IN0063   | 12/1/2020        | 12/1/2021            |
| DC Power Source                | AGILENT E3634A IN0208 | 12/1/2020        | 12/1/2021            |
| Sphere Thermometer             | ONSET IN0085          | 12/1/2020        | 12/1/2021            |
| Room Thermometer               | ONSET IN0046          | 12/1/2020        | 12/1/2021            |

REPORT NUMBER: SP1-2106-271-2

**CIE 1931 Chromaticity Diagram**



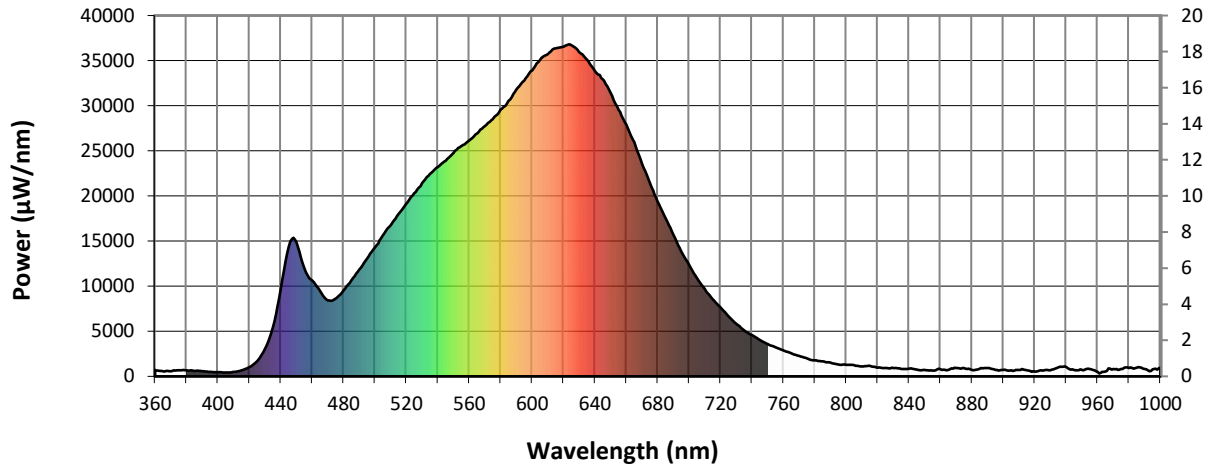
**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 3000K 4-step quadrangle

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**Photopic Flux vs. Wavelength**



#####

| λ (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    | 718           | NR            | 490    | 11837         | NR            | 620    | 36553         | NR            | 750    | 3581          | NR            | 880    | 702           | NR            |
| 365    | 573           | NR            | 495    | 13045         | NR            | 625    | 36706         | NR            | 755    | 3240          | NR            | 885    | 837           | NR            |
| 370    | 566           | NR            | 500    | 14286         | NR            | 630    | 35946         | NR            | 760    | 2875          | NR            | 890    | 938           | NR            |
| 375    | 689           | NR            | 505    | 15591         | NR            | 635    | 35109         | NR            | 765    | 2561          | NR            | 895    | 722           | NR            |
| 380    | 659           | NR            | 510    | 16757         | NR            | 640    | 33848         | NR            | 770    | 2263          | NR            | 900    | 712           | NR            |
| 385    | 616           | NR            | 515    | 17969         | NR            | 645    | 32907         | NR            | 775    | 1981          | NR            | 905    | 660           | NR            |
| 390    | 575           | NR            | 520    | 19153         | NR            | 650    | 31426         | NR            | 780    | 1758          | NR            | 910    | 722           | NR            |
| 395    | 507           | NR            | 525    | 20279         | NR            | 655    | 29538         | NR            | 785    | 1656          | NR            | 915    | 683           | NR            |
| 400    | 452           | NR            | 530    | 21424         | NR            | 660    | 27902         | NR            | 790    | 1510          | NR            | 920    | 536           | NR            |
| 405    | 442           | NR            | 535    | 22450         | NR            | 665    | 25950         | NR            | 795    | 1317          | NR            | 925    | 653           | NR            |
| 410    | 492           | NR            | 540    | 23201         | NR            | 670    | 23596         | NR            | 800    | 1296          | NR            | 930    | 693           | NR            |
| 415    | 658           | NR            | 545    | 23916         | NR            | 675    | 21412         | NR            | 805    | 1239          | NR            | 935    | 1009          | NR            |
| 420    | 1015          | NR            | 550    | 24774         | NR            | 680    | 19353         | NR            | 810    | 1094          | NR            | 940    | 1041          | NR            |
| 425    | 1715          | NR            | 555    | 25531         | NR            | 685    | 17528         | NR            | 815    | 1156          | NR            | 945    | 716           | NR            |
| 430    | 3048          | NR            | 560    | 26160         | NR            | 690    | 15706         | NR            | 820    | 966           | NR            | 950    | 700           | NR            |
| 435    | 5481          | NR            | 565    | 26923         | NR            | 695    | 13845         | NR            | 825    | 931           | NR            | 955    | 812           | NR            |
| 440    | 9614          | NR            | 570    | 27732         | NR            | 700    | 12373         | NR            | 830    | 938           | NR            | 960    | 505           | NR            |
| 445    | 14315         | NR            | 575    | 28529         | NR            | 705    | 10898         | NR            | 835    | 822           | NR            | 965    | 551           | NR            |
| 450    | 14893         | NR            | 580    | 29552         | NR            | 710    | 9649          | NR            | 840    | 838           | NR            | 970    | 824           | NR            |
| 455    | 11988         | NR            | 585    | 30530         | NR            | 715    | 8554          | NR            | 845    | 759           | NR            | 975    | 814           | NR            |
| 460    | 10638         | NR            | 590    | 31835         | NR            | 720    | 7611          | NR            | 850    | 712           | NR            | 980    | 926           | NR            |
| 465    | 9480          | NR            | 595    | 32776         | NR            | 725    | 6679          | NR            | 855    | 651           | NR            | 985    | 954           | NR            |
| 470    | 8416          | NR            | 600    | 33912         | NR            | 730    | 5833          | NR            | 860    | 789           | NR            | 990    | 814           | NR            |
| 475    | 8624          | NR            | 605    | 35057         | NR            | 735    | 5111          | NR            | 865    | 715           | NR            | 995    | 765           | NR            |
| 480    | 9529          | NR            | 610    | 35715         | NR            | 740    | 4579          | NR            | 870    | 935           | NR            | 1000   | 954           | NR            |
| 485    | 10656         | NR            | 615    | 36371         | NR            | 745    | 4054          | NR            | 875    | 919           | NR            |        |               |               |

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**Scotopic Flux vs. Wavelength**



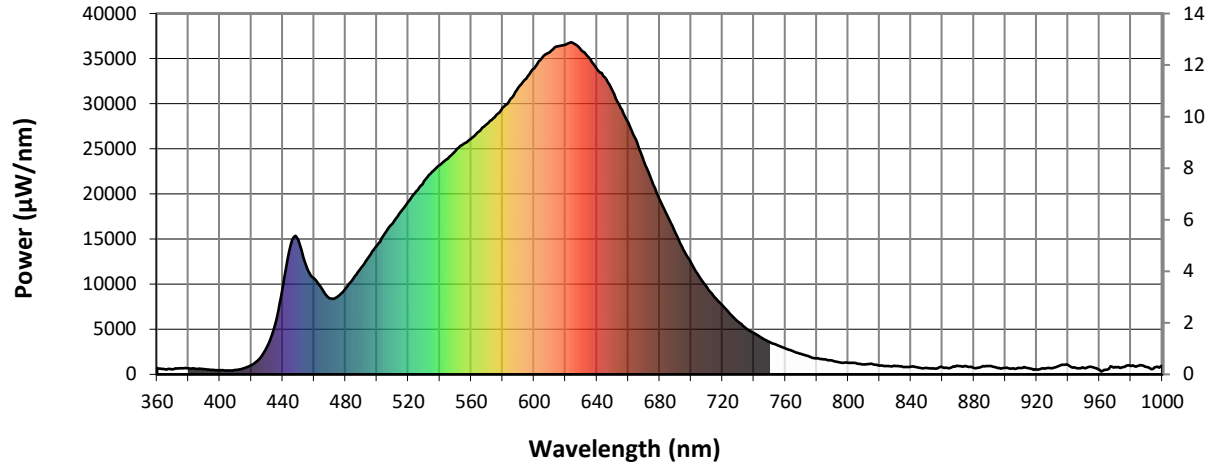
**Scotopic Lumens: 2650.8**

**S/P: 1.41**

| 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    | 718           | NR            | 490    | 11837         | NR            | 620    | 36553         | NR            | 750    | 3581          | NR            | 880    | 702           | NR            |
| 365    | 573           | NR            | 495    | 13045         | NR            | 625    | 36706         | NR            | 755    | 3240          | NR            | 885    | 837           | NR            |
| 370    | 566           | NR            | 500    | 14286         | NR            | 630    | 35946         | NR            | 760    | 2875          | NR            | 890    | 938           | NR            |
| 375    | 689           | NR            | 505    | 15591         | NR            | 635    | 35109         | NR            | 765    | 2561          | NR            | 895    | 722           | NR            |
| 380    | 659           | NR            | 510    | 16757         | NR            | 640    | 33848         | NR            | 770    | 2263          | NR            | 900    | 712           | NR            |
| 385    | 616           | NR            | 515    | 17969         | NR            | 645    | 32907         | NR            | 775    | 1981          | NR            | 905    | 660           | NR            |
| 390    | 575           | NR            | 520    | 19153         | NR            | 650    | 31426         | NR            | 780    | 1758          | NR            | 910    | 722           | NR            |
| 395    | 507           | NR            | 525    | 20279         | NR            | 655    | 29538         | NR            | 785    | 1656          | NR            | 915    | 683           | NR            |
| 400    | 452           | NR            | 530    | 21424         | NR            | 660    | 27902         | NR            | 790    | 1510          | NR            | 920    | 536           | NR            |
| 405    | 442           | NR            | 535    | 22450         | NR            | 665    | 25950         | NR            | 795    | 1317          | NR            | 925    | 653           | NR            |
| 410    | 492           | NR            | 540    | 23201         | NR            | 670    | 23596         | NR            | 800    | 1296          | NR            | 930    | 693           | NR            |
| 415    | 658           | NR            | 545    | 23916         | NR            | 675    | 21412         | NR            | 805    | 1239          | NR            | 935    | 1009          | NR            |
| 420    | 1015          | NR            | 550    | 24774         | NR            | 680    | 19353         | NR            | 810    | 1094          | NR            | 940    | 1041          | NR            |
| 425    | 1715          | NR            | 555    | 25531         | NR            | 685    | 17528         | NR            | 815    | 1156          | NR            | 945    | 716           | NR            |
| 430    | 3048          | NR            | 560    | 26160         | NR            | 690    | 15706         | NR            | 820    | 966           | NR            | 950    | 700           | NR            |
| 435    | 5481          | NR            | 565    | 26923         | NR            | 695    | 13845         | NR            | 825    | 931           | NR            | 955    | 812           | NR            |
| 440    | 9614          | NR            | 570    | 27732         | NR            | 700    | 12373         | NR            | 830    | 938           | NR            | 960    | 505           | NR            |
| 445    | 14315         | NR            | 575    | 28529         | NR            | 705    | 10898         | NR            | 835    | 822           | NR            | 965    | 551           | NR            |
| 450    | 14893         | NR            | 580    | 29552         | NR            | 710    | 9649          | NR            | 840    | 838           | NR            | 970    | 824           | NR            |
| 455    | 11988         | NR            | 585    | 30530         | NR            | 715    | 8554          | NR            | 845    | 759           | NR            | 975    | 814           | NR            |
| 460    | 10638         | NR            | 590    | 31835         | NR            | 720    | 7611          | NR            | 850    | 712           | NR            | 980    | 926           | NR            |
| 465    | 9480          | NR            | 595    | 32776         | NR            | 725    | 6679          | NR            | 855    | 651           | NR            | 985    | 954           | NR            |
| 470    | 8416          | NR            | 600    | 33912         | NR            | 730    | 5833          | NR            | 860    | 789           | NR            | 990    | 814           | NR            |
| 475    | 8624          | NR            | 605    | 35057         | NR            | 735    | 5111          | NR            | 865    | 715           | NR            | 995    | 765           | NR            |
| 480    | 9529          | NR            | 610    | 35715         | NR            | 740    | 4579          | NR            | 870    | 935           | NR            | 1000   | 954           | NR            |
| 485    | 10656         | NR            | 615    | 36371         | NR            | 745    | 4054          | NR            | 875    | 919           | NR            |        |               |               |

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**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: 1008.8 S/P: 0.54**

| 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    | 718           | NR            | 490    | 11837         | NR            | 620    | 36553         | NR            | 750    | 3581          | NR            | 880    | 702           | NR            |
| 365    | 573           | NR            | 495    | 13045         | NR            | 625    | 36706         | NR            | 755    | 3240          | NR            | 885    | 837           | NR            |
| 370    | 566           | NR            | 500    | 14286         | NR            | 630    | 35946         | NR            | 760    | 2875          | NR            | 890    | 938           | NR            |
| 375    | 689           | NR            | 505    | 15591         | NR            | 635    | 35109         | NR            | 765    | 2561          | NR            | 895    | 722           | NR            |
| 380    | 659           | NR            | 510    | 16757         | NR            | 640    | 33848         | NR            | 770    | 2263          | NR            | 900    | 712           | NR            |
| 385    | 616           | NR            | 515    | 17969         | NR            | 645    | 32907         | NR            | 775    | 1981          | NR            | 905    | 660           | NR            |
| 390    | 575           | NR            | 520    | 19153         | NR            | 650    | 31426         | NR            | 780    | 1758          | NR            | 910    | 722           | NR            |
| 395    | 507           | NR            | 525    | 20279         | NR            | 655    | 29538         | NR            | 785    | 1656          | NR            | 915    | 683           | NR            |
| 400    | 452           | NR            | 530    | 21424         | NR            | 660    | 27902         | NR            | 790    | 1510          | NR            | 920    | 536           | NR            |
| 405    | 442           | NR            | 535    | 22450         | NR            | 665    | 25950         | NR            | 795    | 1317          | NR            | 925    | 653           | NR            |
| 410    | 492           | NR            | 540    | 23201         | NR            | 670    | 23596         | NR            | 800    | 1296          | NR            | 930    | 693           | NR            |
| 415    | 658           | NR            | 545    | 23916         | NR            | 675    | 21412         | NR            | 805    | 1239          | NR            | 935    | 1009          | NR            |
| 420    | 1015          | NR            | 550    | 24774         | NR            | 680    | 19353         | NR            | 810    | 1094          | NR            | 940    | 1041          | NR            |
| 425    | 1715          | NR            | 555    | 25531         | NR            | 685    | 17528         | NR            | 815    | 1156          | NR            | 945    | 716           | NR            |
| 430    | 3048          | NR            | 560    | 26160         | NR            | 690    | 15706         | NR            | 820    | 966           | NR            | 950    | 700           | NR            |
| 435    | 5481          | NR            | 565    | 26923         | NR            | 695    | 13845         | NR            | 825    | 931           | NR            | 955    | 812           | NR            |
| 440    | 9614          | NR            | 570    | 27732         | NR            | 700    | 12373         | NR            | 830    | 938           | NR            | 960    | 505           | NR            |
| 445    | 14315         | NR            | 575    | 28529         | NR            | 705    | 10898         | NR            | 835    | 822           | NR            | 965    | 551           | NR            |
| 450    | 14893         | NR            | 580    | 29552         | NR            | 710    | 9649          | NR            | 840    | 838           | NR            | 970    | 824           | NR            |
| 455    | 11988         | NR            | 585    | 30530         | NR            | 715    | 8554          | NR            | 845    | 759           | NR            | 975    | 814           | NR            |
| 460    | 10638         | NR            | 590    | 31835         | NR            | 720    | 7611          | NR            | 850    | 712           | NR            | 980    | 926           | NR            |
| 465    | 9480          | NR            | 595    | 32776         | NR            | 725    | 6679          | NR            | 855    | 651           | NR            | 985    | 954           | NR            |
| 470    | 8416          | NR            | 600    | 33912         | NR            | 730    | 5833          | NR            | 860    | 789           | NR            | 990    | 814           | NR            |
| 475    | 8624          | NR            | 605    | 35057         | NR            | 735    | 5111          | NR            | 865    | 715           | NR            | 995    | 765           | NR            |
| 480    | 9529          | NR            | 610    | 35715         | NR            | 740    | 4579          | NR            | 870    | 935           | NR            | 1000   | 954           | NR            |
| 485    | 10656         | NR            | 615    | 36371         | NR            | 745    | 4054          | NR            | 875    | 919           | NR            |        |               |               |

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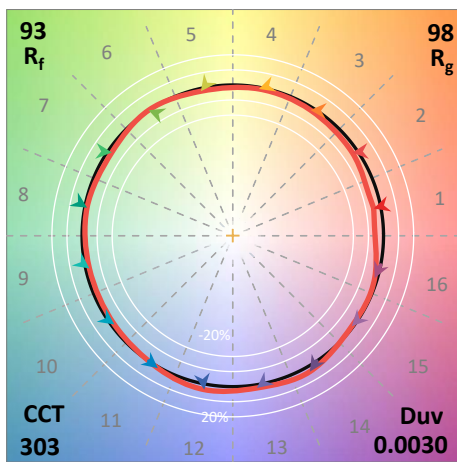
TM-30-18

**Summary**

$R_f = 92.8$   
 $R_g = 98$   
 CIE  $R_a = 92.3$   
 $R_9 = 58.9$



**Color Vector Graphics**



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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 94 | CES51 = 97 | CES76 = 90 |
| CES02 = 63 | CES27 = 94 | CES52 = 98 | CES77 = 92 |
| CES03 = 32 | CES28 = 97 | CES53 = 96 | CES78 = 88 |
| CES04 = 70 | CES29 = 96 | CES54 = 95 | CES79 = 95 |
| CES05 = 50 | CES30 = 97 | CES55 = 94 | CES80 = 95 |
| CES06 = 51 | CES31 = 97 | CES56 = 94 | CES81 = 85 |
| CES07 = 43 | CES32 = 92 | CES57 = 93 | CES82 = 98 |
| CES08 = 42 | CES33 = 99 | CES58 = 94 | CES83 = 97 |
| CES09 = 29 | CES34 = 96 | CES59 = 96 | CES84 = 95 |
| CES10 = 76 | CES35 = 98 | CES60 = 95 | CES85 = 86 |
| CES11 = 58 | CES36 = 88 | CES61 = 94 | CES86 = 85 |
| CES12 = 65 | CES37 = 95 | CES62 = 92 | CES87 = 93 |
| CES13 = 44 | CES38 = 93 | CES63 = 93 | CES88 = 96 |
| CES14 = 74 | CES39 = 99 | CES64 = 91 | CES89 = 87 |
| CES15 = 72 | CES40 = 98 | CES65 = 89 | CES90 = 96 |
| CES16 = 48 | CES41 = 98 | CES66 = 90 | CES91 = 82 |
| CES17 = 50 | CES42 = 97 | CES67 = 89 | CES92 = 82 |
| CES18 = 57 | CES43 = 98 | CES68 = 91 | CES93 = 89 |
| CES19 = 72 | CES44 = 99 | CES69 = 92 | CES94 = 81 |
| CES20 = 67 | CES45 = 99 | CES70 = 89 | CES95 = 86 |
| CES21 = 86 | CES46 = 97 | CES71 = 87 | CES96 = 93 |
| CES22 = 79 | CES47 = 96 | CES72 = 95 | CES97 = 96 |
| CES23 = 92 | CES48 = 93 | CES73 = 86 | CES98 = 94 |
| CES24 = 90 | CES49 = 97 | CES74 = 93 | CES99 = 91 |
| CES25 = 72 | CES50 = 98 | CES75 = 88 |            |



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Color Rendition by Hue-Angle Bin



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Measure Comparisons



(END OF REPORT)