

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: P321967

Luminaire Tested: **GLEON-SA3C-750-U-T2-HSS**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P321967  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-13)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA3C-750-U-T2-HSS  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(3) 70 CRI, 5000K, 1050mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE II  
OPTICS WITH HOUSE SIDE SHIELD  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 15362 lumens  
Efficiency: N/A  
Efficacy: 92.5 lumens/watt  
Luminous Opening: Rectangular (W 1' x L: 1' x H: 0')  
IES Classification: Type II - Medium  
BUG Rating: B1 - U0 - G3

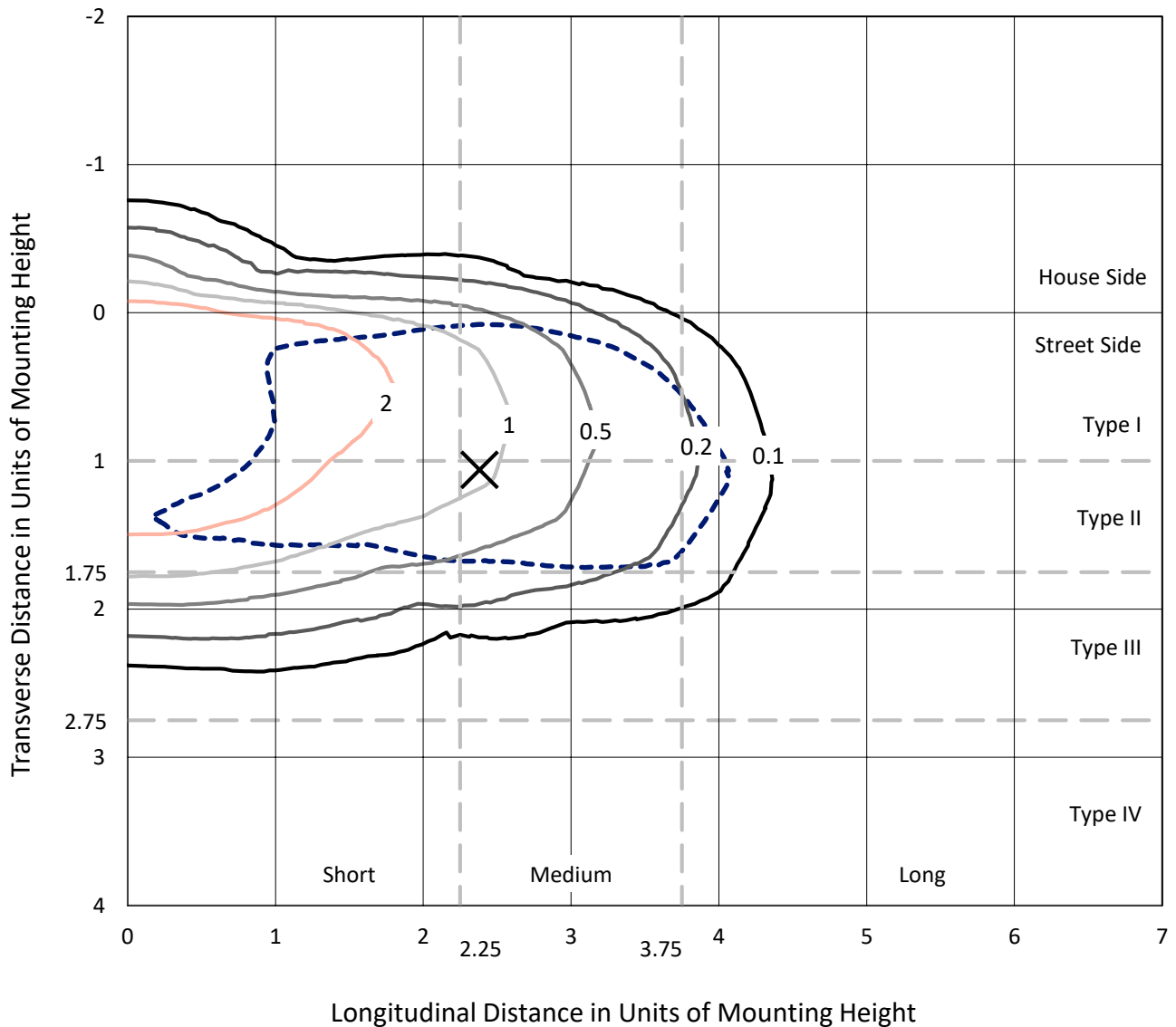
Input Watts (W): 166  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



REPORT NUMBER: P321967  
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### Iso-Footcandle Lines of Horizontal Illumination

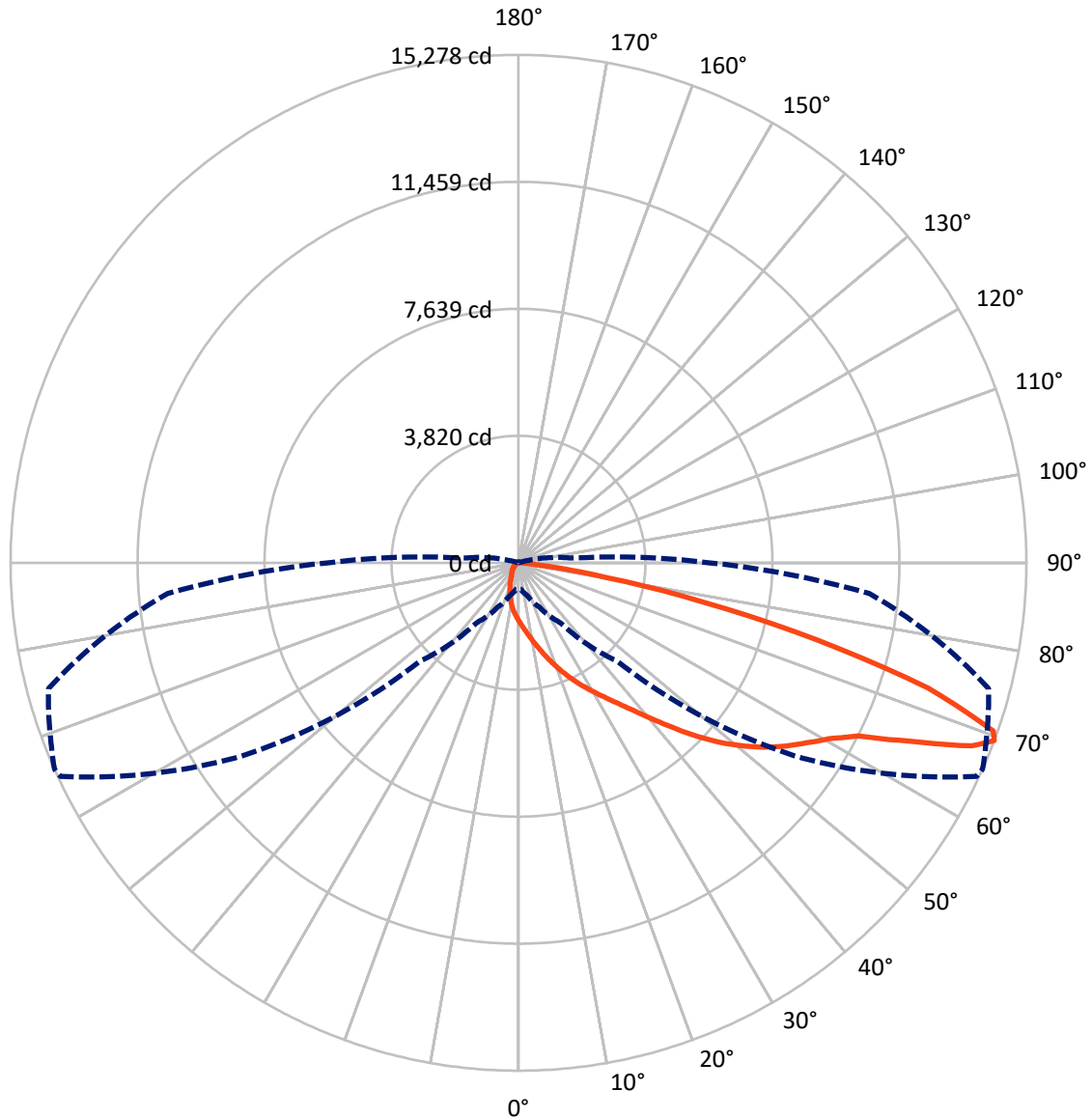
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 4.6 fc  
 Type II - Medium - N/A

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### Luminous Intensity Polar Plot



— Vertical Plane Through 66-Deg Lateral      - - - Horizontal Cone Through 69-Deg Vertical

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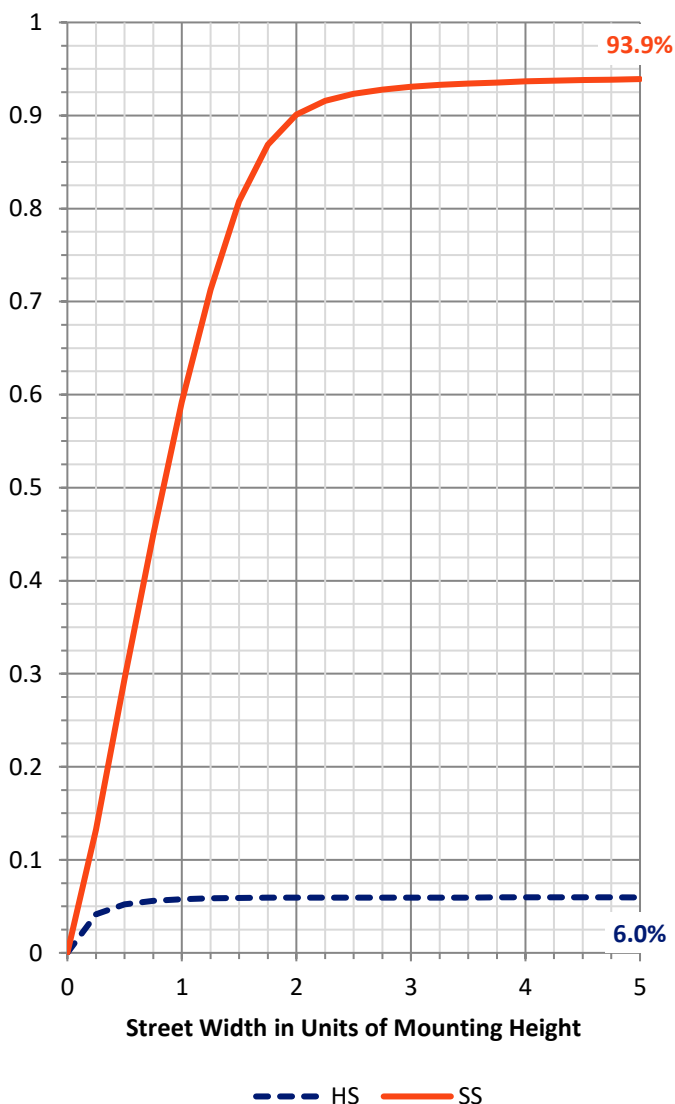
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 921.5    | 0.0    | 921.5   |
|                    | % Fixture | 6.0      | 0.0    | 6.0     |
| <b>Street Side</b> | Lumens    | 14440.5  | 0.0    | 14440.5 |
|                    | % Fixture | 94.0     | 0.0    | 94.0    |
| <b>Total</b>       | Lumens    | 15362.0  | 0.0    | 15362.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 169.0   | 1.1       |
| 10°-20°   | 502.9   | 3.3       |
| 20°-30°   | 875.8   | 5.7       |
| 30°-40°   | 1536.6  | 10.0      |
| 40°-50°   | 2572.1  | 16.7      |
| 50°-60°   | 3780.7  | 24.6      |
| 60°-70°   | 3881.8  | 25.3      |
| 70°-80°   | 1916.3  | 12.5      |
| 80°-90°   | 126.7   | 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°    | 15362.0 | 100.0     |
| 0°-180°   | 15362.0 | 100.0     |

**Coefficient of Utilization**

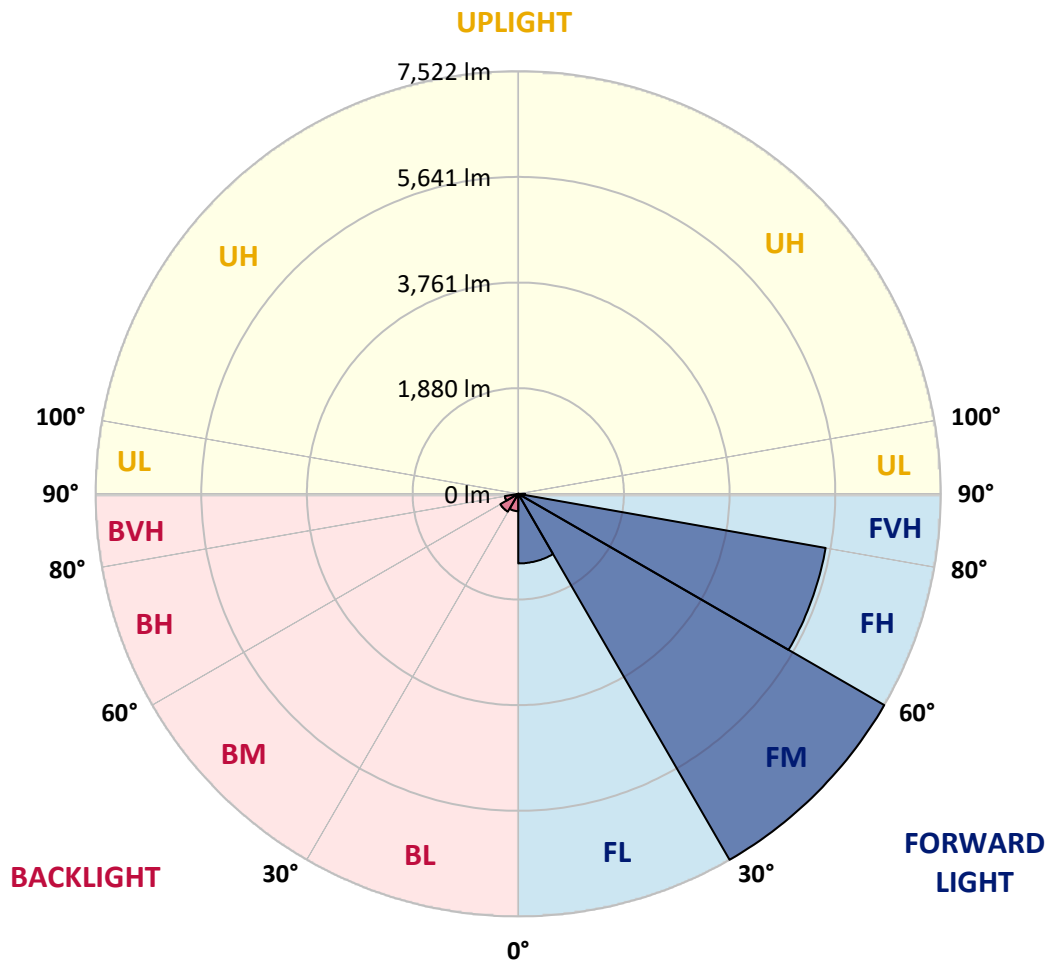


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**LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:**

| Zone           | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|----------------|--------|-----------|-------------------------|------|---------|
|                |        |           | B                       | U    | G       |
| FL (0°-30°)    | 1239.6 | 8.1       |                         |      |         |
| FM (30°-60°)   | 7522.0 | 49.0      |                         |      |         |
| FH (60°-80°)   | 5555.3 | 36.2      |                         |      | G3/7500 |
| FVH (80°-90°)  | 123.6  | 0.8       |                         |      | G2/225  |
| BL (0°-30°)    | 308.2  | 2.0       | B1/500                  |      |         |
| BM (30°-60°)   | 367.4  | 2.4       | B1/1000                 |      |         |
| BH (60°-80°)   | 242.8  | 1.6       | B1/500                  |      | G1/500  |
| BVH (80°-90°)  | 3.1    | 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-G3**  
 Type II Medium





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°     | 65°     | 66°     | 75°     | 85°     |
|-------|--------|--------|--------|--------|--------|--------|---------|---------|---------|---------|---------|
| 0°    | 1748.2 | 1748.2 | 1748.2 | 1748.2 | 1748.2 | 1748.2 | 1748.2  | 1748.2  | 1748.2  | 1748.2  | 1748.2  |
| 2.5°  | 2057.6 | 2048.9 | 2045.2 | 2029.2 | 2001.4 | 1980.3 | 1939.4  | 1892.0  | 1883.2  | 1837.3  | 1781.1  |
| 5°    | 2324.7 | 2317.4 | 2312.3 | 2289.6 | 2261.2 | 2207.9 | 2133.5  | 2045.2  | 2028.4  | 1940.9  | 1828.5  |
| 7.5°  | 2510.7 | 2523.9 | 2523.9 | 2509.3 | 2473.5 | 2433.4 | 2342.2  | 2221.8  | 2200.6  | 2066.4  | 1892.0  |
| 10°   | 2619.4 | 2635.5 | 2647.9 | 2660.3 | 2655.2 | 2639.1 | 2553.1  | 2417.3  | 2391.8  | 2213.8  | 1965.7  |
| 12.5° | 2629.7 | 2645.7 | 2680.7 | 2732.5 | 2782.9 | 2819.4 | 2765.4  | 2634.0  | 2604.9  | 2384.5  | 2053.2  |
| 15°   | 2572.8 | 2589.5 | 2643.5 | 2744.2 | 2866.1 | 2972.6 | 2990.1  | 2874.1  | 2844.2  | 2588.1  | 2162.7  |
| 17.5° | 2473.5 | 2484.5 | 2561.8 | 2701.2 | 2892.3 | 3087.9 | 3193.7  | 3131.7  | 3103.9  | 2820.8  | 2284.5  |
| 20°   | 2399.8 | 2407.8 | 2475.7 | 2625.3 | 2876.3 | 3160.1 | 3386.3  | 3405.3  | 3376.1  | 3070.4  | 2416.6  |
| 22.5° | 2526.1 | 2540.6 | 2542.8 | 2613.6 | 2832.5 | 3195.9 | 3555.6  | 3674.5  | 3652.6  | 3335.2  | 2546.5  |
| 25°   | 2871.2 | 2888.0 | 2832.5 | 2788.7 | 2869.7 | 3211.9 | 3700.8  | 3950.3  | 3932.8  | 3620.5  | 2677.1  |
| 27.5° | 3327.2 | 3344.7 | 3273.2 | 3142.6 | 3064.5 | 3272.5 | 3829.9  | 4230.5  | 4229.8  | 3922.6  | 2817.9  |
| 30°   | 3775.2 | 3792.7 | 3719.8 | 3589.2 | 3409.7 | 3444.0 | 3941.6  | 4523.8  | 4528.2  | 4234.2  | 2967.5  |
| 32.5° | 4245.1 | 4267.0 | 4191.8 | 4024.0 | 3836.5 | 3740.2 | 4098.5  | 4818.6  | 4843.4  | 4595.3  | 3136.0  |
| 35°   | 4779.2 | 4782.1 | 4676.3 | 4500.5 | 4284.5 | 4136.4 | 4350.2  | 5149.2  | 5208.3  | 5042.6  | 3349.8  |
| 37.5° | 5303.1 | 5324.3 | 5237.4 | 4960.2 | 4761.7 | 4593.9 | 4724.5  | 5562.1  | 5646.0  | 5589.1  | 3629.3  |
| 40°   | 5691.3 | 5735.8 | 5723.4 | 5424.2 | 5236.0 | 5116.3 | 5189.3  | 6053.2  | 6159.7  | 6225.4  | 3981.7  |
| 42.5° | 5935.0 | 5968.5 | 6025.5 | 5845.2 | 5674.5 | 5694.2 | 5738.0  | 6625.2  | 6756.6  | 6950.7  | 4386.7  |
| 45°   | 6214.4 | 6230.5 | 6277.9 | 6198.4 | 6083.1 | 6281.6 | 6320.2  | 7269.5  | 7407.4  | 7730.7  | 4836.1  |
| 47.5° | 6555.9 | 6593.9 | 6607.0 | 6534.0 | 6481.5 | 6801.1 | 6881.3  | 7855.4  | 8048.8  | 8566.1  | 5311.9  |
| 50°   | 6990.8 | 7001.0 | 7023.6 | 6976.2 | 6923.7 | 7247.6 | 7384.8  | 8470.5  | 8646.4  | 9404.5  | 5781.0  |
| 52.5° | 7416.2 | 7452.7 | 7531.5 | 7501.5 | 7480.4 | 7627.8 | 7833.5  | 9025.1  | 9221.3  | 10103.5 | 6249.5  |
| 55°   | 7538.8 | 7570.1 | 7842.3 | 8028.4 | 8200.6 | 8096.2 | 8262.6  | 9522.0  | 9734.3  | 10728.1 | 6700.4  |
| 57.5° | 7049.2 | 7112.6 | 7584.0 | 8068.5 | 8782.8 | 8824.4 | 8852.1  | 10032.0 | 10222.4 | 11206.7 | 7169.6  |
| 60°   | 5811.7 | 5824.1 | 6597.5 | 7428.6 | 8686.5 | 9459.9 | 9713.1  | 10579.9 | 10739.7 | 11652.5 | 7731.4  |
| 62.5° | 3696.4 | 3822.6 | 4671.2 | 5844.5 | 7667.9 | 9368.0 | 10754.3 | 11408.8 | 11467.2 | 12187.4 | 8536.9  |
| 65°   | 1760.6 | 1842.4 | 2453.8 | 3611.0 | 5554.1 | 8191.1 | 11473.0 | 12908.3 | 12934.5 | 13247.6 | 9613.2  |
| 67.5° | 974.8  | 1014.2 | 1305.3 | 1943.8 | 3246.9 | 5792.7 | 11182.6 | 14684.2 | 14709.0 | 14330.4 | 10557.3 |
| 69°   | 762.5  | 796.0  | 1025.2 | 1465.1 | 2201.4 | 4163.4 | 10119.5 | 15204.5 | 15278.2 | 14640.5 | 10590.9 |
| 70°   | 647.2  | 680.0  | 882.9  | 1237.5 | 1770.1 | 3217.0 | 9007.5  | 15075.3 | 15153.4 | 14611.3 | 10340.6 |
| 72.5° | 396.2  | 415.2  | 588.1  | 871.2  | 1186.4 | 1618.4 | 5554.8  | 12749.2 | 12881.3 | 13403.0 | 8887.2  |
| 75°   | 267.1  | 277.3  | 367.7  | 601.2  | 848.6  | 833.3  | 2885.8  | 8986.4  | 9272.4  | 10426.0 | 6563.9  |
| 77.5° | 191.2  | 200.7  | 246.6  | 388.9  | 594.7  | 550.2  | 1306.8  | 5584.8  | 5646.0  | 6253.1  | 3579.7  |
| 80°   | 108.7  | 117.5  | 174.4  | 231.3  | 403.5  | 367.0  | 519.5   | 2667.6  | 2698.3  | 2681.5  | 1195.2  |
| 82.5° | 56.9   | 64.2   | 95.6   | 152.5  | 259.0  | 240.1  | 216.0   | 893.1   | 897.5   | 746.4   | 261.9   |
| 85°   | 10.9   | 13.1   | 47.4   | 104.3  | 133.5  | 104.3  | 88.3    | 209.4   | 213.8   | 189.0   | 64.9    |
| 87.5° | 0.0    | 0.7    | 19.0   | 23.3   | 26.3   | 27.0   | 28.5    | 40.9    | 43.8    | 59.1    | 17.5    |
| 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: GLEON-SA3C-750-U-T2-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1748.2 | 1748.2 | 1748.2 | 1748.2 | 1748.2 | 1748.2 | 1748.2 | 1748.2 | 1748.2 | 1748.2 | 1748.2 |
| 2.5°  | 1756.3 | 1730.0 | 1679.7 | 1621.3 | 1576.0 | 1531.5 | 1496.5 | 1460.0 | 1446.9 | 1440.3 | 1439.6 |
| 5°    | 1773.8 | 1718.3 | 1611.8 | 1502.4 | 1412.6 | 1328.0 | 1267.4 | 1209.8 | 1182.8 | 1170.4 | 1165.3 |
| 7.5°  | 1803.0 | 1714.0 | 1542.5 | 1375.4 | 1246.2 | 1140.4 | 1056.5 | 993.8  | 962.4  | 949.3  | 944.2  |
| 10°   | 1837.3 | 1708.1 | 1461.5 | 1241.1 | 1076.2 | 966.8  | 883.6  | 821.6  | 787.3  | 772.7  | 765.4  |
| 12.5° | 1877.4 | 1697.9 | 1368.1 | 1105.4 | 931.0  | 821.6  | 720.9  | 644.3  | 604.9  | 588.1  | 580.1  |
| 15°   | 1927.0 | 1687.7 | 1270.3 | 977.7  | 803.3  | 669.8  | 559.6  | 507.8  | 499.8  | 496.9  | 497.6  |
| 17.5° | 1975.9 | 1671.6 | 1163.8 | 851.5  | 669.1  | 523.2  | 467.0  | 464.1  | 465.5  | 465.5  | 465.5  |
| 20°   | 2019.7 | 1635.1 | 1047.8 | 743.5  | 541.4  | 441.4  | 429.8  | 424.7  | 421.0  | 418.1  | 414.4  |
| 22.5° | 2054.0 | 1586.3 | 936.1  | 636.3  | 442.2  | 404.2  | 386.0  | 369.9  | 356.8  | 348.0  | 343.7  |
| 25°   | 2077.3 | 1521.3 | 834.0  | 533.4  | 397.7  | 367.7  | 334.9  | 307.9  | 287.5  | 275.1  | 270.0  |
| 27.5° | 2094.8 | 1451.3 | 742.8  | 446.5  | 367.0  | 325.4  | 282.4  | 250.3  | 229.1  | 218.2  | 213.8  |
| 30°   | 2107.2 | 1371.7 | 662.5  | 392.6  | 332.7  | 280.9  | 234.9  | 203.6  | 188.3  | 182.4  | 179.5  |
| 32.5° | 2118.9 | 1283.5 | 586.6  | 367.0  | 300.6  | 240.1  | 197.0  | 172.9  | 163.4  | 156.1  | 154.0  |
| 35°   | 2148.1 | 1201.7 | 514.4  | 340.0  | 267.8  | 205.0  | 169.3  | 151.8  | 142.3  | 137.9  | 136.4  |
| 37.5° | 2217.4 | 1141.2 | 445.1  | 312.3  | 234.9  | 177.3  | 148.1  | 135.7  | 127.0  | 122.6  | 121.1  |
| 40°   | 2329.0 | 1110.5 | 386.7  | 282.4  | 202.8  | 156.1  | 134.3  | 122.6  | 113.1  | 106.5  | 105.1  |
| 42.5° | 2493.2 | 1114.9 | 345.9  | 252.5  | 177.3  | 139.4  | 121.1  | 107.3  | 97.0   | 91.2   | 89.7   |
| 45°   | 2692.4 | 1147.0 | 317.4  | 223.3  | 156.1  | 126.2  | 106.5  | 91.9   | 82.5   | 77.3   | 75.9   |
| 47.5° | 2908.4 | 1198.8 | 294.0  | 197.0  | 139.4  | 113.8  | 91.9   | 76.6   | 68.6   | 64.2   | 63.5   |
| 50°   | 3136.0 | 1249.2 | 270.0  | 171.5  | 124.8  | 101.4  | 77.3   | 63.5   | 56.9   | 53.3   | 51.8   |
| 52.5° | 3366.6 | 1307.5 | 248.1  | 148.1  | 112.4  | 86.8   | 64.2   | 51.8   | 46.7   | 43.8   | 42.3   |
| 55°   | 3614.7 | 1351.3 | 226.9  | 129.9  | 100.0  | 73.7   | 53.3   | 43.0   | 38.7   | 35.0   | 34.3   |
| 57.5° | 3906.6 | 1419.2 | 205.0  | 112.4  | 85.4   | 61.3   | 43.8   | 34.3   | 30.6   | 27.0   | 26.3   |
| 60°   | 4300.6 | 1498.7 | 181.7  | 99.2   | 70.0   | 50.3   | 35.8   | 27.7   | 23.3   | 20.4   | 19.7   |
| 62.5° | 4820.1 | 1587.0 | 152.5  | 86.8   | 56.9   | 40.9   | 28.5   | 21.9   | 16.8   | 13.1   | 13.1   |
| 65°   | 5479.0 | 1730.7 | 124.8  | 73.0   | 46.7   | 33.6   | 21.9   | 16.1   | 9.5    | 5.8    | 5.8    |
| 67.5° | 5863.5 | 1755.5 | 100.7  | 59.8   | 37.9   | 28.5   | 18.2   | 10.9   | 2.9    | 0.7    | 0.0    |
| 69°   | 5740.2 | 1611.8 | 85.4   | 51.1   | 32.8   | 27.0   | 16.8   | 8.0    | 1.5    | 0.0    | 0.0    |
| 70°   | 5508.1 | 1473.9 | 75.2   | 45.2   | 29.9   | 25.5   | 16.1   | 5.8    | 1.5    | 0.0    | 0.0    |
| 72.5° | 4551.6 | 1049.2 | 56.9   | 33.6   | 21.9   | 22.6   | 14.6   | 3.6    | 1.5    | 0.0    | 0.0    |
| 75°   | 3315.5 | 637.7  | 40.9   | 23.3   | 13.9   | 16.8   | 10.2   | 1.5    | 0.7    | 0.0    | 0.0    |
| 77.5° | 1844.6 | 300.6  | 25.5   | 13.1   | 8.8    | 10.2   | 5.1    | 0.0    | 0.0    | 0.0    | 0.0    |
| 80°   | 599.0  | 81.7   | 11.7   | 7.3    | 5.1    | 5.8    | 2.2    | 0.0    | 0.0    | 0.0    | 0.0    |
| 82.5° | 110.9  | 23.3   | 6.6    | 3.6    | 1.5    | 1.5    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 85°   | 24.1   | 9.5    | 3.6    | 1.5    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 87.5° | 8.0    | 2.9    | 0.7    | 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    |



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

Report Prepared for

Cooper Lighting Solutions

McGRAW-EDISON

Report Number: SP1-1908-441-4-R4

Test Date: 10/02/2019

Luminaire Tested: SA1C-750-U-5WQ

Data in this report applies to families of products SA1C-760-U-5WQ .

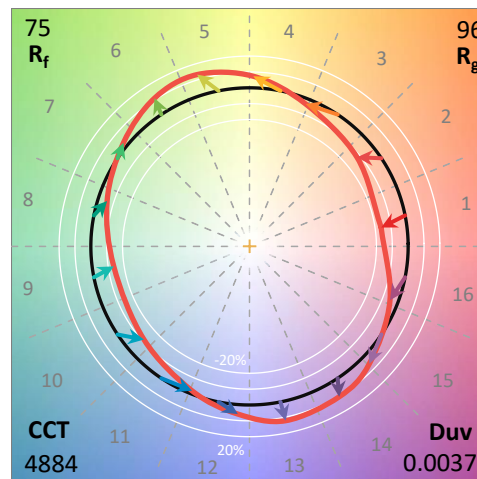
**Test Information**

Test Method: LM-79-2008  
 Report Number: SP1-1908-441-4-R4  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry: 4π  
 Issue Date: 10/28/2024  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: MCGRAW-EDISON  
 Catalog Number: **SA1C-750-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):                  | 4884   | CRI (Ra): | 73.5 | R9:  | -28.4 |
| CIE u':                   | 0.2101 | R1:       | 70.5 | R10: | 48.6  |
| CIE v':                   | 0.4904 | R2:       | 77.7 | R11: | 73.2  |
| Duv:                      | 0.0037 | R3:       | 84.6 | R12: | 50.7  |
| CIE x:                    | 0.3493 | R4:       | 74.7 | R13: | 71.2  |
| CIE y:                    | 0.3624 | R5:       | 71.9 | R14: | 91.4  |
| CIE z:                    | 0.2884 | R6:       | 70.7 |      |       |
| Peak Wavelength (nm):     | 444    | R7:       | 81.2 |      |       |
| Dominant Wavelength (nm): | 571    | R8:       | 56.9 |      |       |
| Purity:                   | 13.7   |           |      |      |       |
| Rf:                       | 74.9   |           |      |      |       |
| Rg:                       | 96.3   |           |      |      |       |



**Test Conditions**

Stabilization Time: 240M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 25.0./44%  
 Sphere Temperature (°C): 25.7

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

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CIE 1931 Chromaticity Diagram



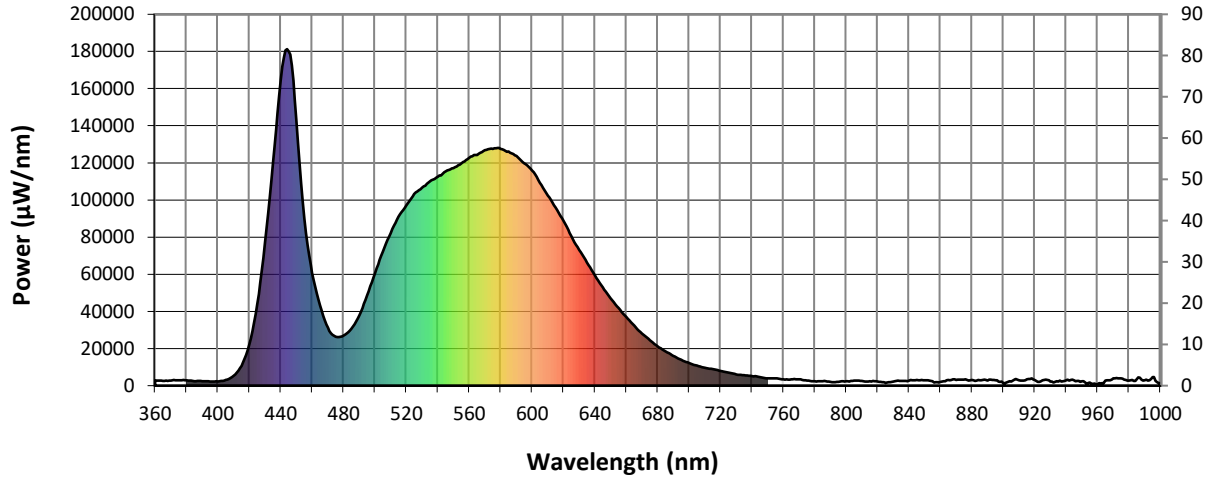
CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles



Point lies inside the ANSI 5000K 4-step quadrangle

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**Photopic Flux vs. Wavelength**



#####

| $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) |
|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|
| 360               | 2945                                 | NR                             | 490               | 37941                                | NR                             | 620               | 88803                                | NR                             | 750               | 3908                                 | NR                             | 880               | 2997                                 | NR                             |
| 365               | 2596                                 | NR                             | 495               | 48525                                | NR                             | 625               | 80578                                | NR                             | 755               | 3988                                 | NR                             | 885               | 2927                                 | NR                             |
| 370               | 2732                                 | NR                             | 500               | 60609                                | NR                             | 630               | 73127                                | NR                             | 760               | 3335                                 | NR                             | 890               | 2649                                 | NR                             |
| 375               | 2894                                 | NR                             | 505               | 72036                                | NR                             | 635               | 66244                                | NR                             | 765               | 3438                                 | NR                             | 895               | 2828                                 | NR                             |
| 380               | 2822                                 | NR                             | 510               | 82168                                | NR                             | 640               | 59440                                | NR                             | 770               | 3427                                 | NR                             | 900               | 1407                                 | NR                             |
| 385               | 2394                                 | NR                             | 515               | 90898                                | NR                             | 645               | 52864                                | NR                             | 775               | 2759                                 | NR                             | 905               | 2224                                 | NR                             |
| 390               | 2370                                 | NR                             | 520               | 97142                                | NR                             | 650               | 47085                                | NR                             | 780               | 2340                                 | NR                             | 910               | 2905                                 | NR                             |
| 395               | 2267                                 | NR                             | 525               | 103255                               | NR                             | 655               | 41789                                | NR                             | 785               | 2412                                 | NR                             | 915               | 3350                                 | NR                             |
| 400               | 2262                                 | NR                             | 530               | 106697                               | NR                             | 660               | 37064                                | NR                             | 790               | 1999                                 | NR                             | 920               | 3114                                 | NR                             |
| 405               | 3000                                 | NR                             | 535               | 110081                               | NR                             | 665               | 32299                                | NR                             | 795               | 2054                                 | NR                             | 925               | 2834                                 | NR                             |
| 410               | 5324                                 | NR                             | 540               | 112494                               | NR                             | 670               | 28142                                | NR                             | 800               | 2331                                 | NR                             | 930               | 2271                                 | NR                             |
| 415               | 10725                                | NR                             | 545               | 115513                               | NR                             | 675               | 24505                                | NR                             | 805               | 2648                                 | NR                             | 935               | 2228                                 | NR                             |
| 420               | 22128                                | NR                             | 550               | 117203                               | NR                             | 680               | 21162                                | NR                             | 810               | 2485                                 | NR                             | 940               | 2833                                 | NR                             |
| 425               | 44095                                | NR                             | 555               | 119753                               | NR                             | 685               | 18400                                | NR                             | 815               | 2409                                 | NR                             | 945               | 2941                                 | NR                             |
| 430               | 77002                                | NR                             | 560               | 122602                               | NR                             | 690               | 16065                                | NR                             | 820               | 2221                                 | NR                             | 950               | 2323                                 | NR                             |
| 435               | 119881                               | NR                             | 565               | 124314                               | NR                             | 695               | 13860                                | NR                             | 825               | 1562                                 | NR                             | 955               | 1667                                 | NR                             |
| 440               | 164454                               | NR                             | 570               | 126775                               | NR                             | 700               | 12177                                | NR                             | 830               | 2249                                 | NR                             | 960               | 749                                  | NR                             |
| 445               | 179997                               | NR                             | 575               | 127511                               | NR                             | 705               | 10757                                | NR                             | 835               | 2573                                 | NR                             | 965               | 2669                                 | NR                             |
| 450               | 142822                               | NR                             | 580               | 127577                               | NR                             | 710               | 9601                                 | NR                             | 840               | 2764                                 | NR                             | 970               | 3968                                 | NR                             |
| 455               | 90008                                | NR                             | 585               | 126153                               | NR                             | 715               | 8944                                 | NR                             | 845               | 3109                                 | NR                             | 975               | 3886                                 | NR                             |
| 460               | 60557                                | NR                             | 590               | 123678                               | NR                             | 720               | 7947                                 | NR                             | 850               | 2963                                 | NR                             | 980               | 2788                                 | NR                             |
| 465               | 43305                                | NR                             | 595               | 119774                               | NR                             | 725               | 7062                                 | NR                             | 855               | 2336                                 | NR                             | 985               | 3496                                 | NR                             |
| 470               | 31089                                | NR                             | 600               | 115733                               | NR                             | 730               | 6004                                 | NR                             | 860               | 2118                                 | NR                             | 990               | 2913                                 | NR                             |
| 475               | 26278                                | NR                             | 605               | 109231                               | NR                             | 735               | 5594                                 | NR                             | 865               | 3144                                 | NR                             | 995               | 4659                                 | NR                             |
| 480               | 27060                                | NR                             | 610               | 102408                               | NR                             | 740               | 5165                                 | NR                             | 870               | 3069                                 | NR                             | 1000              | 1308                                 | NR                             |
| 485               | 30698                                | NR                             | 615               | 96015                                | NR                             | 745               | 4687                                 | NR                             | 875               | 3311                                 | NR                             |                   |                                      |                                |

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Scotopic Flux vs. Wavelength



Scotopic Lumens: 13493.5 S/P: 1.77

| 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    | 2945          | NR            | 490    | 37941         | NR            | 620    | 88803         | NR            | 750    | 3908          | NR            | 880    | 2997          | NR            |
| 365    | 2596          | NR            | 495    | 48525         | NR            | 625    | 80578         | NR            | 755    | 3988          | NR            | 885    | 2927          | NR            |
| 370    | 2732          | NR            | 500    | 60609         | NR            | 630    | 73127         | NR            | 760    | 3335          | NR            | 890    | 2649          | NR            |
| 375    | 2894          | NR            | 505    | 72036         | NR            | 635    | 66244         | NR            | 765    | 3438          | NR            | 895    | 2828          | NR            |
| 380    | 2822          | NR            | 510    | 82168         | NR            | 640    | 59440         | NR            | 770    | 3427          | NR            | 900    | 1407          | NR            |
| 385    | 2394          | NR            | 515    | 90898         | NR            | 645    | 52864         | NR            | 775    | 2759          | NR            | 905    | 2224          | NR            |
| 390    | 2370          | NR            | 520    | 97142         | NR            | 650    | 47085         | NR            | 780    | 2340          | NR            | 910    | 2905          | NR            |
| 395    | 2267          | NR            | 525    | 103255        | NR            | 655    | 41789         | NR            | 785    | 2412          | NR            | 915    | 3350          | NR            |
| 400    | 2262          | NR            | 530    | 106697        | NR            | 660    | 37064         | NR            | 790    | 1999          | NR            | 920    | 3114          | NR            |
| 405    | 3000          | NR            | 535    | 110081        | NR            | 665    | 32299         | NR            | 795    | 2054          | NR            | 925    | 2834          | NR            |
| 410    | 5324          | NR            | 540    | 112494        | NR            | 670    | 28142         | NR            | 800    | 2331          | NR            | 930    | 2271          | NR            |
| 415    | 10725         | NR            | 545    | 115513        | NR            | 675    | 24505         | NR            | 805    | 2648          | NR            | 935    | 2228          | NR            |
| 420    | 22128         | NR            | 550    | 117203        | NR            | 680    | 21162         | NR            | 810    | 2485          | NR            | 940    | 2833          | NR            |
| 425    | 44095         | NR            | 555    | 119753        | NR            | 685    | 18400         | NR            | 815    | 2409          | NR            | 945    | 2941          | NR            |
| 430    | 77002         | NR            | 560    | 122602        | NR            | 690    | 16065         | NR            | 820    | 2221          | NR            | 950    | 2323          | NR            |
| 435    | 119881        | NR            | 565    | 124314        | NR            | 695    | 13860         | NR            | 825    | 1562          | NR            | 955    | 1667          | NR            |
| 440    | 164454        | NR            | 570    | 126775        | NR            | 700    | 12177         | NR            | 830    | 2249          | NR            | 960    | 749           | NR            |
| 445    | 179997        | NR            | 575    | 127511        | NR            | 705    | 10757         | NR            | 835    | 2573          | NR            | 965    | 2669          | NR            |
| 450    | 142822        | NR            | 580    | 127577        | NR            | 710    | 9601          | NR            | 840    | 2764          | NR            | 970    | 3968          | NR            |
| 455    | 90008         | NR            | 585    | 126153        | NR            | 715    | 8944          | NR            | 845    | 3109          | NR            | 975    | 3886          | NR            |
| 460    | 60557         | NR            | 590    | 123678        | NR            | 720    | 7947          | NR            | 850    | 2963          | NR            | 980    | 2788          | NR            |
| 465    | 43305         | NR            | 595    | 119774        | NR            | 725    | 7062          | NR            | 855    | 2336          | NR            | 985    | 3496          | NR            |
| 470    | 31089         | NR            | 600    | 115733        | NR            | 730    | 6004          | NR            | 860    | 2118          | NR            | 990    | 2913          | NR            |
| 475    | 26278         | NR            | 605    | 109231        | NR            | 735    | 5594          | NR            | 865    | 3144          | NR            | 995    | 4659          | NR            |
| 480    | 27060         | NR            | 610    | 102408        | NR            | 740    | 5165          | NR            | 870    | 3069          | NR            | 1000   | 1308          | NR            |
| 485    | 30698         | NR            | 615    | 96015         | NR            | 745    | 4687          | NR            | 875    | 3311          | NR            |        |               |               |

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**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: 5378.9 M/P: 0.71**

| 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    | 2945          | NR            | 490    | 37941         | NR            | 620    | 88803         | NR            | 750    | 3908          | NR            | 880    | 2997          | NR            |
| 365    | 2596          | NR            | 495    | 48525         | NR            | 625    | 80578         | NR            | 755    | 3988          | NR            | 885    | 2927          | NR            |
| 370    | 2732          | NR            | 500    | 60609         | NR            | 630    | 73127         | NR            | 760    | 3335          | NR            | 890    | 2649          | NR            |
| 375    | 2894          | NR            | 505    | 72036         | NR            | 635    | 66244         | NR            | 765    | 3438          | NR            | 895    | 2828          | NR            |
| 380    | 2822          | NR            | 510    | 82168         | NR            | 640    | 59440         | NR            | 770    | 3427          | NR            | 900    | 1407          | NR            |
| 385    | 2394          | NR            | 515    | 90898         | NR            | 645    | 52864         | NR            | 775    | 2759          | NR            | 905    | 2224          | NR            |
| 390    | 2370          | NR            | 520    | 97142         | NR            | 650    | 47085         | NR            | 780    | 2340          | NR            | 910    | 2905          | NR            |
| 395    | 2267          | NR            | 525    | 103255        | NR            | 655    | 41789         | NR            | 785    | 2412          | NR            | 915    | 3350          | NR            |
| 400    | 2262          | NR            | 530    | 106697        | NR            | 660    | 37064         | NR            | 790    | 1999          | NR            | 920    | 3114          | NR            |
| 405    | 3000          | NR            | 535    | 110081        | NR            | 665    | 32299         | NR            | 795    | 2054          | NR            | 925    | 2834          | NR            |
| 410    | 5324          | NR            | 540    | 112494        | NR            | 670    | 28142         | NR            | 800    | 2331          | NR            | 930    | 2271          | NR            |
| 415    | 10725         | NR            | 545    | 115513        | NR            | 675    | 24505         | NR            | 805    | 2648          | NR            | 935    | 2228          | NR            |
| 420    | 22128         | NR            | 550    | 117203        | NR            | 680    | 21162         | NR            | 810    | 2485          | NR            | 940    | 2833          | NR            |
| 425    | 44095         | NR            | 555    | 119753        | NR            | 685    | 18400         | NR            | 815    | 2409          | NR            | 945    | 2941          | NR            |
| 430    | 77002         | NR            | 560    | 122602        | NR            | 690    | 16065         | NR            | 820    | 2221          | NR            | 950    | 2323          | NR            |
| 435    | 119881        | NR            | 565    | 124314        | NR            | 695    | 13860         | NR            | 825    | 1562          | NR            | 955    | 1667          | NR            |
| 440    | 164454        | NR            | 570    | 126775        | NR            | 700    | 12177         | NR            | 830    | 2249          | NR            | 960    | 749           | NR            |
| 445    | 179997        | NR            | 575    | 127511        | NR            | 705    | 10757         | NR            | 835    | 2573          | NR            | 965    | 2669          | NR            |
| 450    | 142822        | NR            | 580    | 127577        | NR            | 710    | 9601          | NR            | 840    | 2764          | NR            | 970    | 3968          | NR            |
| 455    | 90008         | NR            | 585    | 126153        | NR            | 715    | 8944          | NR            | 845    | 3109          | NR            | 975    | 3886          | NR            |
| 460    | 60557         | NR            | 590    | 123678        | NR            | 720    | 7947          | NR            | 850    | 2963          | NR            | 980    | 2788          | NR            |
| 465    | 43305         | NR            | 595    | 119774        | NR            | 725    | 7062          | NR            | 855    | 2336          | NR            | 985    | 3496          | NR            |
| 470    | 31089         | NR            | 600    | 115733        | NR            | 730    | 6004          | NR            | 860    | 2118          | NR            | 990    | 2913          | NR            |
| 475    | 26278         | NR            | 605    | 109231        | NR            | 735    | 5594          | NR            | 865    | 3144          | NR            | 995    | 4659          | NR            |
| 480    | 27060         | NR            | 610    | 102408        | NR            | 740    | 5165          | NR            | 870    | 3069          | NR            | 1000   | 1308          | NR            |
| 485    | 30698         | NR            | 615    | 96015         | NR            | 745    | 4687          | NR            | 875    | 3311          | NR            |        |               |               |

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**Summary**

$R_f = 74.9$   
 $R_g = 96.3$   
 CIE  $R_a = 73.5$   
 $R_g = -28.4$



**Color Vector Graphics**





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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 61 | CES51 = 90 | CES76 = 52 |
| CES02 = 60 | CES27 = 84 | CES52 = 91 | CES77 = 71 |
| CES03 = 30 | CES28 = 81 | CES53 = 79 | CES78 = 54 |
| CES04 = 69 | CES29 = 58 | CES54 = 83 | CES79 = 80 |
| CES05 = 46 | CES30 = 67 | CES55 = 83 | CES80 = 77 |
| CES06 = 50 | CES31 = 63 | CES56 = 73 | CES81 = 77 |
| CES07 = 39 | CES32 = 59 | CES57 = 72 | CES82 = 90 |
| CES08 = 38 | CES33 = 69 | CES58 = 73 | CES83 = 86 |
| CES09 = 29 | CES34 = 69 | CES59 = 88 | CES84 = 88 |
| CES10 = 73 | CES35 = 83 | CES60 = 93 | CES85 = 84 |
| CES11 = 56 | CES36 = 95 | CES61 = 88 | CES86 = 75 |
| CES12 = 61 | CES37 = 78 | CES62 = 85 | CES87 = 78 |
| CES13 = 41 | CES38 = 76 | CES63 = 77 | CES88 = 79 |
| CES14 = 74 | CES39 = 93 | CES64 = 74 | CES89 = 75 |
| CES15 = 70 | CES40 = 86 | CES65 = 67 | CES90 = 77 |
| CES16 = 46 | CES41 = 87 | CES66 = 69 | CES91 = 89 |
| CES17 = 49 | CES42 = 78 | CES67 = 67 | CES92 = 66 |
| CES18 = 55 | CES43 = 75 | CES68 = 73 | CES93 = 80 |
| CES19 = 71 | CES44 = 99 | CES69 = 81 | CES94 = 57 |
| CES20 = 64 | CES45 = 83 | CES70 = 63 | CES95 = 71 |
| CES21 = 85 | CES46 = 81 | CES71 = 60 | CES96 = 78 |
| CES22 = 77 | CES47 = 80 | CES72 = 86 | CES97 = 85 |
| CES23 = 91 | CES48 = 72 | CES73 = 53 | CES98 = 75 |
| CES24 = 90 | CES49 = 81 | CES74 = 96 | CES99 = 62 |
| CES25 = 71 | CES50 = 89 | CES75 = 58 |            |



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Color Rendition by Hue-Angle Bin



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Measure Comparisons



(END OF REPORT)