

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: P322958

Luminaire Tested: **GLEON-SA4B-760-U-T4W-HSS**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P322958  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-19)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA4B-760-U-T4W-HSS  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(4) 70 CRI, 5700K, 800mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE IV WIDE OPTICS WITH HOUSE SIDE SHIELD  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 16708 lumens  
Efficiency: N/A  
Efficacy: 97.7 lumens/watt  
Luminous Opening: Rectangular (W 1' x L: 1' x H: 0')  
IES Classification: Type IV - Short  
BUG Rating: B1 - U0 - G4

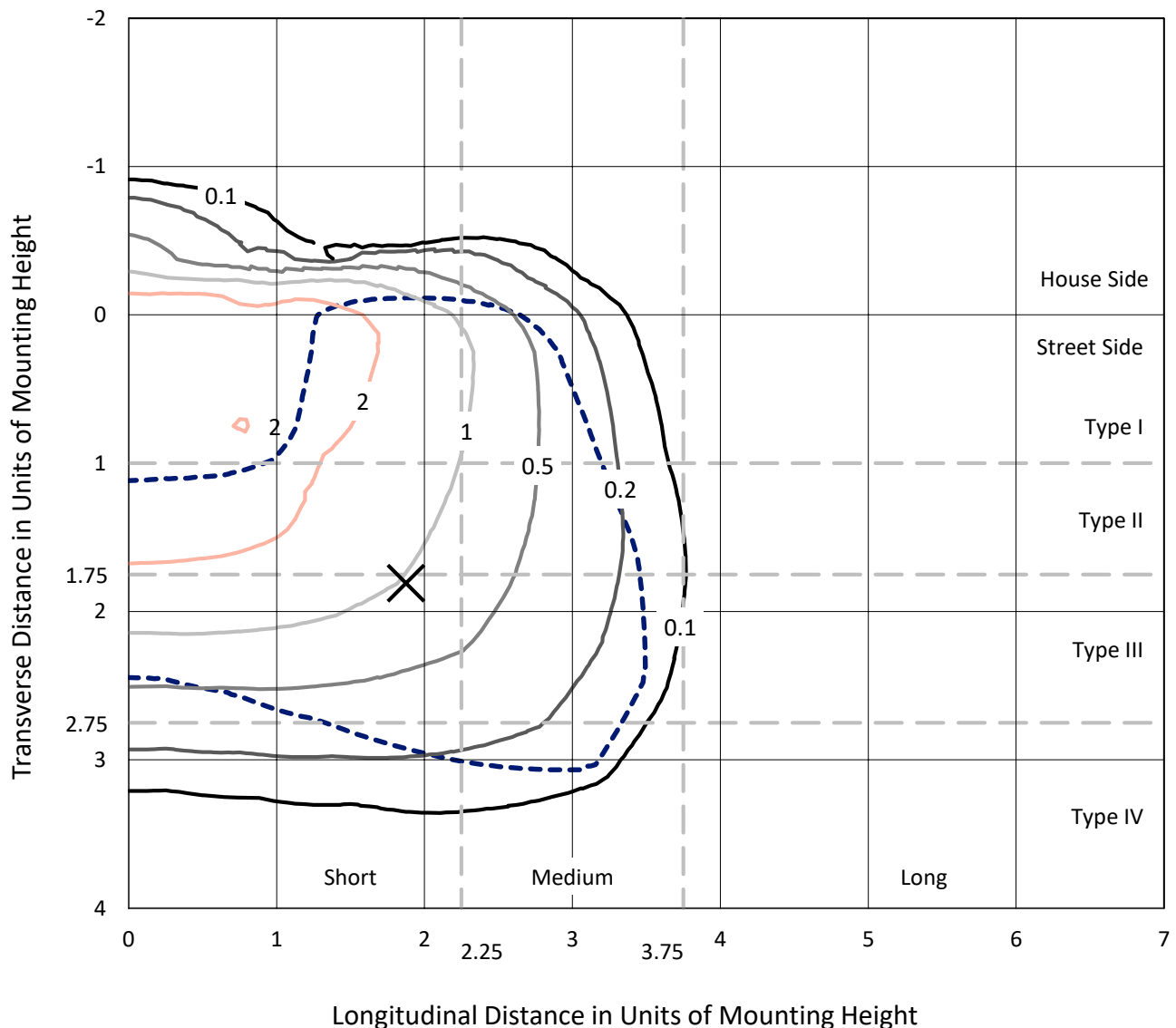
Input Watts (W): 171  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



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## Iso-Footcandle Lines of Horizontal Illumination

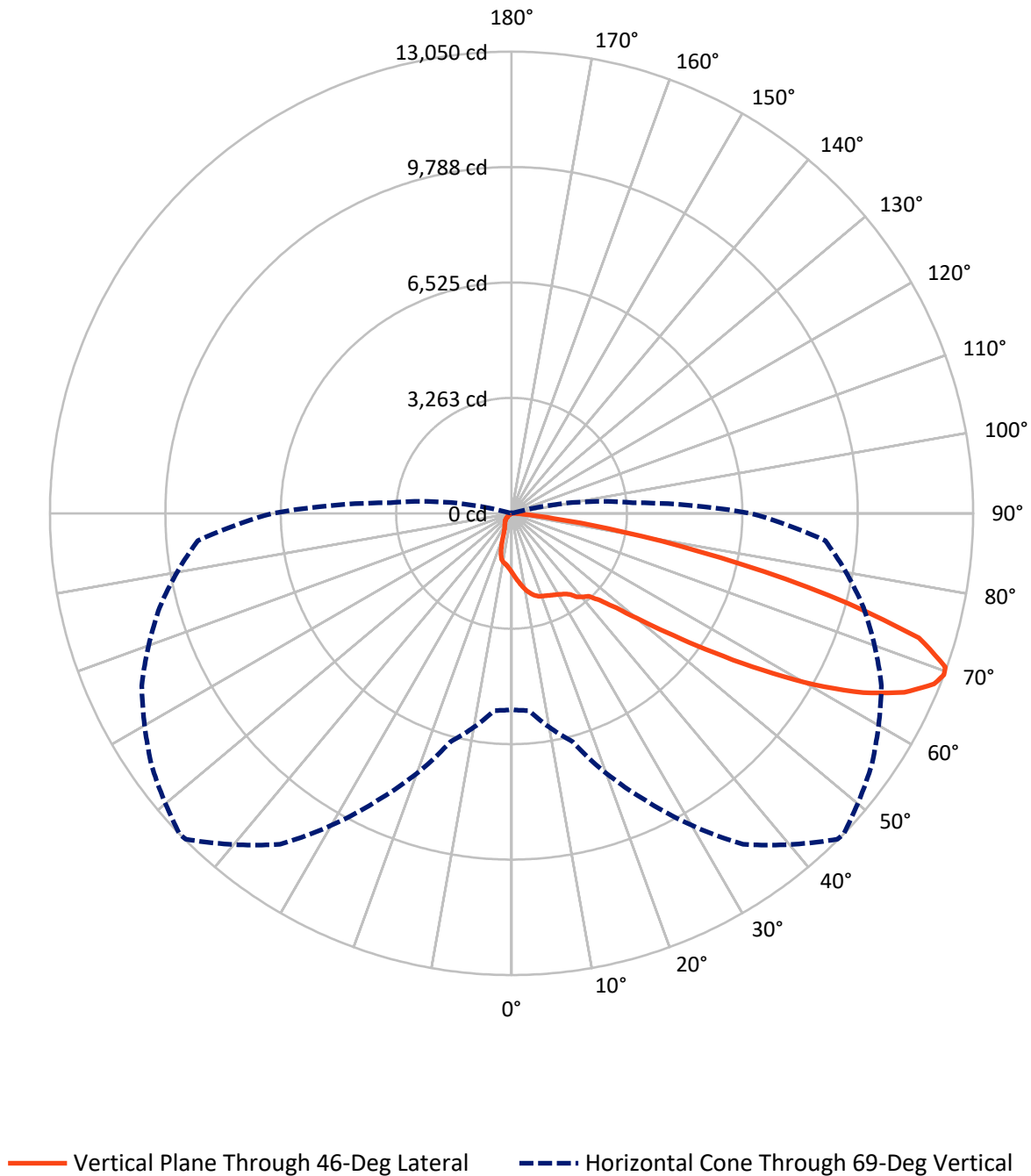
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 3.9 fc  
 Type IV - Short - N/A

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## Luminous Intensity Polar Plot



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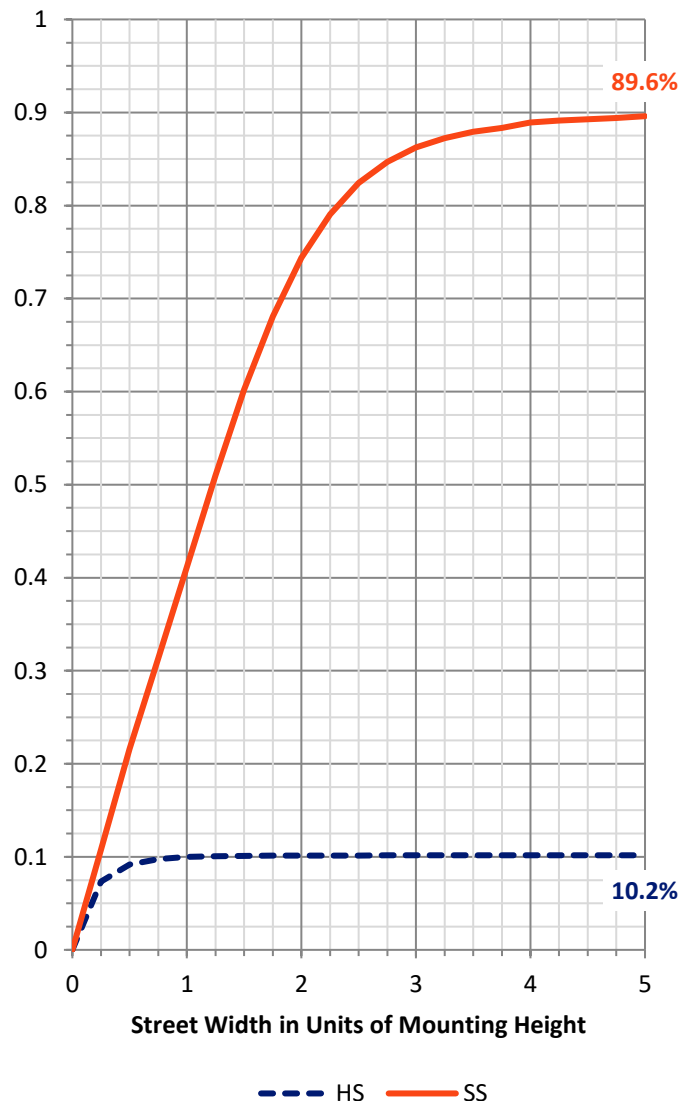
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 1714.7   | 0.0    | 1714.7  |
|                    | % Fixture | 10.3     | 0.0    | 10.3    |
| <b>Street Side</b> | Lumens    | 14993.3  | 0.0    | 14993.3 |
|                    | % Fixture | 89.7     | 0.0    | 89.7    |
| <b>Total</b>       | Lumens    | 16708.0  | 0.0    | 16708.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 166.6   | 1.0       |
| 10°-20°   | 505.5   | 3.0       |
| 20°-30°   | 795.0   | 4.8       |
| 30°-40°   | 1140.0  | 6.8       |
| 40°-50°   | 1970.4  | 11.8      |
| 50°-60°   | 3892.7  | 23.3      |
| 60°-70°   | 5440.4  | 32.6      |
| 70°-80°   | 2628.3  | 15.7      |
| 80°-90°   | 168.9   | 1.0       |
| 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°    | 16708.0 | 100.0     |
| 0°-180°   | 16708.0 | 100.0     |

**Coefficient of Utilization**



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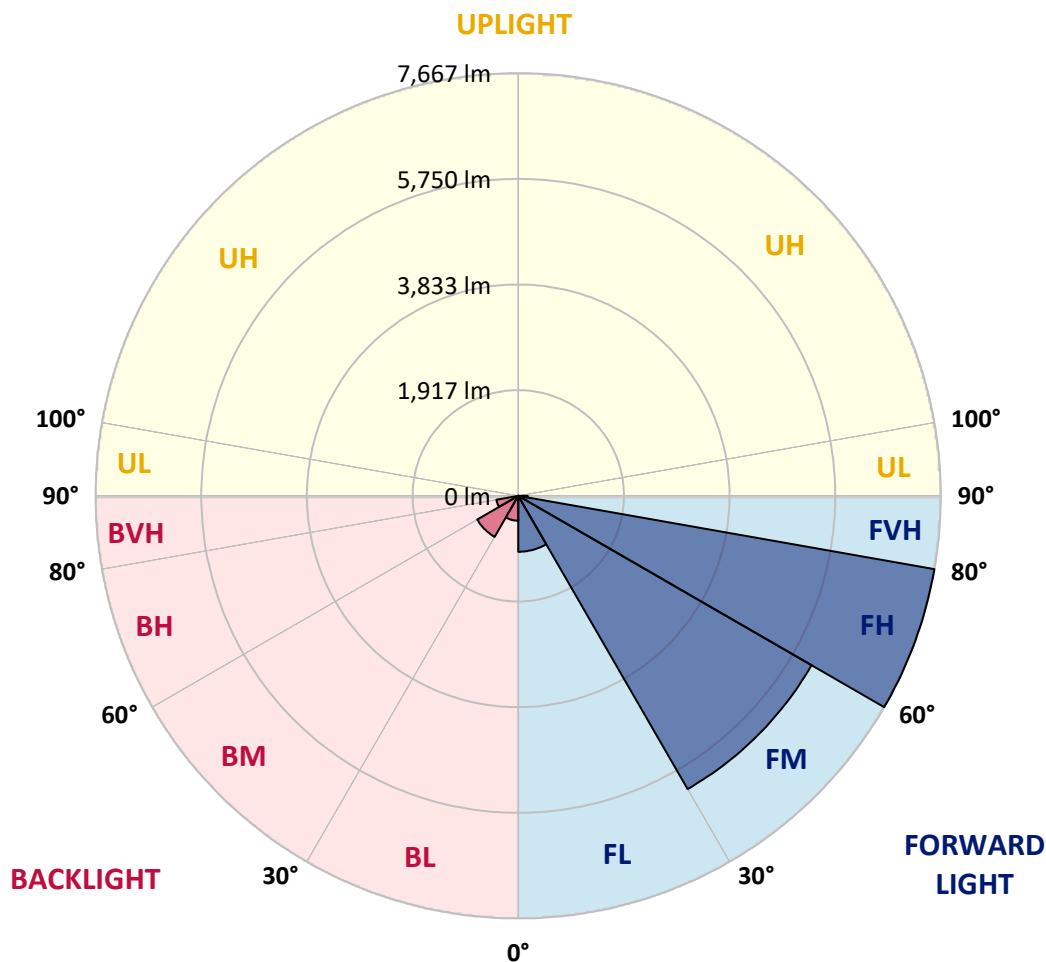
CATALOG NUMBER: GLEON-SA4B-760-U-T4W-HSS

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |          |
|------|-------------|--------|-----------|-------------------------|------|----------|
|      |             |        |           | B                       | U    | G        |
| FL   | (0°-30°)    | 1015.2 | 6.1       |                         |      |          |
| FM   | (30°-60°)   | 6143.9 | 36.8      |                         |      |          |
| FH   | (60°-80°)   | 7666.7 | 45.9      |                         |      | G4/12000 |
| FVH  | (80°-90°)   | 167.5  | 1.0       |                         |      | G2/225   |
| BL   | (0°-30°)    | 451.9  | 2.7       | B1/500                  |      |          |
| BM   | (30°-60°)   | 859.3  | 5.1       | B1/1000                 |      |          |
| BH   | (60°-80°)   | 402.1  | 2.4       | B1/500                  |      | G1/500   |
| BVH  | (80°-90°)   | 1.4    | 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-G4**

Type IV Short





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°     | 35°     | 45°     | 46°     | 55°     | 65°     | 75°     | 85°     |
|-------|--------|--------|--------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 1674.1 | 1674.1 | 1674.1 | 1674.1  | 1674.1  | 1674.1  | 1674.1  | 1674.1  | 1674.1  | 1674.1  | 1674.1  |
| 2.5°  | 1859.7 | 1857.4 | 1846.4 | 1841.7  | 1815.1  | 1799.4  | 1793.2  | 1773.6  | 1745.4  | 1717.2  | 1685.8  |
| 5°    | 2071.3 | 2070.5 | 2050.1 | 2030.5  | 1980.4  | 1933.4  | 1924.8  | 1879.3  | 1815.9  | 1756.3  | 1696.8  |
| 7.5°  | 2287.5 | 2277.3 | 2256.9 | 2219.3  | 2146.5  | 2071.3  | 2064.2  | 2000.0  | 1909.9  | 1823.7  | 1738.3  |
| 10°   | 2470.8 | 2464.5 | 2437.9 | 2380.7  | 2295.3  | 2209.9  | 2201.3  | 2122.2  | 2020.3  | 1914.6  | 1805.7  |
| 12.5° | 2613.3 | 2608.6 | 2573.4 | 2502.1  | 2411.2  | 2322.7  | 2311.0  | 2240.5  | 2131.6  | 2013.3  | 1884.8  |
| 15°   | 2700.3 | 2698.0 | 2654.9 | 2578.9  | 2489.6  | 2412.8  | 2402.6  | 2340.7  | 2239.7  | 2115.9  | 1971.0  |
| 17.5° | 2720.7 | 2721.5 | 2676.8 | 2600.0  | 2526.4  | 2471.6  | 2463.7  | 2416.7  | 2332.1  | 2209.1  | 2057.2  |
| 20°   | 2675.2 | 2684.6 | 2644.7 | 2578.1  | 2532.7  | 2503.7  | 2497.4  | 2469.2  | 2397.9  | 2282.0  | 2126.1  |
| 22.5° | 2611.0 | 2615.7 | 2588.3 | 2543.6  | 2524.8  | 2530.3  | 2527.2  | 2511.5  | 2451.2  | 2344.7  | 2194.2  |
| 25°   | 2571.8 | 2571.8 | 2555.4 | 2517.8  | 2530.3  | 2564.0  | 2564.8  | 2561.6  | 2513.9  | 2421.4  | 2277.3  |
| 27.5° | 2570.3 | 2565.6 | 2546.8 | 2518.6  | 2553.0  | 2604.7  | 2607.9  | 2629.0  | 2599.2  | 2514.6  | 2380.7  |
| 30°   | 2632.9 | 2627.5 | 2587.5 | 2550.7  | 2594.5  | 2650.2  | 2658.0  | 2704.2  | 2689.3  | 2615.7  | 2495.8  |
| 32.5° | 2779.4 | 2759.8 | 2671.3 | 2611.0  | 2643.9  | 2710.5  | 2720.7  | 2794.3  | 2817.8  | 2740.3  | 2607.1  |
| 35°   | 2980.0 | 2918.1 | 2790.4 | 2725.4  | 2728.5  | 2798.2  | 2807.6  | 2915.7  | 2985.5  | 2854.6  | 2693.3  |
| 37.5° | 3256.5 | 3226.0 | 3018.4 | 2844.4  | 2858.5  | 2964.3  | 2991.7  | 3109.2  | 3089.6  | 2917.3  | 2791.2  |
| 40°   | 3862.8 | 3815.1 | 3594.1 | 3178.2  | 2983.1  | 3099.0  | 3107.7  | 3170.3  | 3171.9  | 3059.1  | 2994.9  |
| 42.5° | 4688.5 | 4668.9 | 4436.3 | 3783.7  | 3228.3  | 3189.1  | 3204.8  | 3310.6  | 3428.8  | 3358.3  | 3355.2  |
| 45°   | 5602.7 | 5592.5 | 5345.8 | 4587.5  | 3724.2  | 3484.5  | 3504.1  | 3645.8  | 3872.2  | 3887.9  | 3987.4  |
| 47.5° | 6338.3 | 6333.6 | 6191.8 | 5484.4  | 4483.3  | 3985.0  | 3991.3  | 4141.7  | 4539.7  | 4736.3  | 4895.3  |
| 50°   | 7008.9 | 7031.6 | 6919.6 | 6455.0  | 5517.3  | 4769.2  | 4754.3  | 4854.6  | 5493.8  | 5815.8  | 6013.2  |
| 52.5° | 7941.1 | 7973.2 | 7659.1 | 7360.6  | 6602.3  | 5742.2  | 5730.4  | 5835.4  | 6640.7  | 6882.0  | 6917.2  |
| 55°   | 8764.4 | 8709.6 | 8461.3 | 8375.1  | 7925.4  | 6943.9  | 6940.7  | 7033.2  | 7750.0  | 7852.6  | 7917.6  |
| 57.5° | 9127.9 | 9106.8 | 9226.6 | 9424.0  | 9311.2  | 8364.1  | 8357.1  | 8286.6  | 8742.5  | 8753.5  | 8953.2  |
| 60°   | 9357.5 | 9383.3 | 9750.7 | 10359.4 | 10640.6 | 9892.5  | 9847.1  | 9417.0  | 9690.4  | 9666.1  | 9880.0  |
| 62.5° | 9185.1 | 9236.0 | 9897.2 | 10911.7 | 11635.5 | 11226.6 | 11162.4 | 10452.6 | 10500.4 | 10416.6 | 10615.6 |
| 65°   | 8270.1 | 8349.2 | 9432.7 | 10807.5 | 12129.0 | 12269.3 | 12204.2 | 11366.8 | 11143.6 | 11005.7 | 10895.2 |
| 67.5° | 6715.1 | 6762.1 | 7893.3 | 9901.1  | 11906.6 | 12891.3 | 12878.0 | 12168.2 | 11629.2 | 10906.2 | 10049.2 |
| 69°   | 5549.5 | 5595.7 | 6684.6 | 8947.0  | 11417.0 | 13024.4 | 13050.3 | 12425.2 | 11536.8 | 10301.4 | 8903.9  |
| 70°   | 4700.3 | 4749.6 | 5764.1 | 8129.1  | 10849.0 | 12962.6 | 13008.8 | 12400.9 | 11272.0 | 9601.1  | 7898.8  |
| 72.5° | 2465.3 | 2507.6 | 3548.7 | 5600.4  | 8844.3  | 11902.6 | 12042.9 | 11352.7 | 9554.9  | 6972.8  | 4670.5  |
| 75°   | 774.8  | 799.0  | 1385.8 | 2927.5  | 6055.5  | 9254.8  | 9286.9  | 8905.4  | 6784.8  | 3835.4  | 1945.1  |
| 77.5° | 295.3  | 288.3  | 461.4  | 1078.7  | 3061.4  | 5827.6  | 6024.2  | 5565.1  | 3560.5  | 1356.0  | 448.9   |
| 80°   | 159.0  | 159.8  | 239.7  | 446.5   | 1309.8  | 2994.9  | 3160.9  | 2697.2  | 1265.2  | 423.0   | 103.4   |
| 82.5° | 68.9   | 72.1   | 134.7  | 236.6   | 601.6   | 1104.6  | 1187.6  | 988.6   | 483.3   | 284.4   | 38.4    |
| 85°   | 14.9   | 16.5   | 65.0   | 128.5   | 245.2   | 310.2   | 325.1   | 320.4   | 307.9   | 220.9   | 14.9    |
| 87.5° | 0.0    | 0.0    | 29.0   | 46.2    | 61.9    | 70.5    | 61.9    | 80.7    | 170.0   | 148.8   | 7.8     |
| 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: P322958

CATALOG NUMBER: GLEON-SA4B-760-U-T4W-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1674.1 | 1674.1 | 1674.1 | 1674.1 | 1674.1 | 1674.1 | 1674.1 | 1674.1 | 1674.1 | 1674.1 | 1674.1 |
| 2.5°  | 1675.6 | 1661.5 | 1637.3 | 1610.6 | 1591.8 | 1572.2 | 1556.6 | 1549.5 | 1541.7 | 1536.2 | 1543.3 |
| 5°    | 1672.5 | 1645.1 | 1598.1 | 1552.7 | 1519.8 | 1493.1 | 1471.2 | 1462.6 | 1453.9 | 1447.7 | 1446.9 |
| 7.5°  | 1699.9 | 1661.5 | 1589.5 | 1522.9 | 1472.0 | 1435.9 | 1406.2 | 1393.6 | 1383.4 | 1378.7 | 1374.8 |
| 10°   | 1752.4 | 1703.1 | 1606.7 | 1519.8 | 1453.9 | 1392.8 | 1328.6 | 1279.3 | 1247.1 | 1232.3 | 1226.8 |
| 12.5° | 1820.6 | 1758.7 | 1639.6 | 1536.2 | 1440.6 | 1323.1 | 1186.8 | 1069.3 | 993.3  | 968.3  | 953.4  |
| 15°   | 1900.5 | 1823.7 | 1682.7 | 1557.4 | 1392.1 | 1177.4 | 946.3  | 792.8  | 722.3  | 708.2  | 692.5  |
| 17.5° | 1977.2 | 1892.6 | 1734.4 | 1561.3 | 1285.5 | 940.8  | 693.3  | 589.1  | 561.7  | 571.1  | 573.4  |
| 20°   | 2044.6 | 1960.8 | 1785.3 | 1526.8 | 1092.0 | 705.8  | 536.6  | 510.8  | 520.9  | 539.0  | 542.1  |
| 22.5° | 2112.8 | 2026.6 | 1832.3 | 1435.9 | 844.5  | 535.8  | 483.3  | 489.6  | 499.8  | 517.8  | 520.9  |
| 25°   | 2195.8 | 2106.5 | 1876.2 | 1269.1 | 633.8  | 455.9  | 459.1  | 468.5  | 478.6  | 495.1  | 496.7  |
| 27.5° | 2291.4 | 2207.6 | 1905.2 | 1052.1 | 470.0  | 419.1  | 429.3  | 443.4  | 453.6  | 469.2  | 472.4  |
| 30°   | 2418.3 | 2340.7 | 1914.6 | 827.2  | 394.0  | 386.2  | 390.9  | 408.1  | 423.0  | 437.1  | 439.5  |
| 32.5° | 2537.4 | 2472.3 | 1883.2 | 624.4  | 365.1  | 355.7  | 355.7  | 365.8  | 383.1  | 396.4  | 399.5  |
| 35°   | 2647.0 | 2604.7 | 1783.0 | 456.7  | 343.1  | 327.5  | 319.6  | 319.6  | 330.6  | 341.6  | 344.7  |
| 37.5° | 2792.0 | 2790.4 | 1620.8 | 364.3  | 322.0  | 304.0  | 287.5  | 275.0  | 271.0  | 273.4  | 275.0  |
| 40°   | 3040.3 | 3042.6 | 1409.3 | 326.7  | 304.0  | 279.7  | 254.6  | 231.9  | 210.7  | 203.7  | 202.9  |
| 42.5° | 3428.1 | 3392.8 | 1187.6 | 308.7  | 288.3  | 254.6  | 217.0  | 186.4  | 153.5  | 143.4  | 142.6  |
| 45°   | 4043.8 | 3834.6 | 952.6  | 292.2  | 271.8  | 226.4  | 179.4  | 137.9  | 111.2  | 103.4  | 103.4  |
| 47.5° | 4940.8 | 4415.1 | 737.9  | 274.2  | 249.9  | 194.3  | 135.5  | 99.5   | 81.5   | 77.6   | 78.3   |
| 50°   | 5868.3 | 4983.9 | 565.6  | 251.5  | 223.3  | 160.6  | 100.3  | 72.1   | 61.9   | 61.9   | 62.7   |
| 52.5° | 6690.8 | 5400.6 | 441.0  | 227.2  | 190.4  | 126.1  | 76.0   | 56.4   | 51.7   | 50.9   | 51.7   |
| 55°   | 7460.9 | 5669.3 | 337.6  | 199.0  | 151.2  | 94.0   | 58.0   | 46.2   | 43.1   | 41.5   | 40.7   |
| 57.5° | 8203.5 | 5802.5 | 253.0  | 160.6  | 109.7  | 68.2   | 46.2   | 39.2   | 36.0   | 33.7   | 32.9   |
| 60°   | 8697.8 | 5694.4 | 173.9  | 118.3  | 76.0   | 49.4   | 38.4   | 33.7   | 29.8   | 27.4   | 26.6   |
| 62.5° | 8976.7 | 5399.0 | 112.0  | 85.4   | 54.1   | 36.8   | 30.6   | 28.2   | 22.7   | 20.4   | 20.4   |
| 65°   | 8863.9 | 4911.8 | 78.3   | 61.1   | 39.2   | 27.4   | 22.7   | 22.7   | 16.5   | 13.3   | 12.5   |
| 67.5° | 7854.9 | 4149.6 | 59.5   | 45.4   | 28.2   | 20.4   | 17.2   | 19.6   | 10.2   | 6.3    | 6.3    |
| 69°   | 6758.2 | 3439.0 | 50.9   | 37.6   | 23.5   | 16.5   | 14.9   | 18.0   | 7.1    | 4.7    | 3.9    |
| 70°   | 5873.8 | 2966.7 | 46.2   | 32.9   | 19.6   | 14.1   | 13.3   | 17.2   | 7.1    | 3.9    | 3.1    |
| 72.5° | 3514.2 | 1654.5 | 35.3   | 23.5   | 12.5   | 11.0   | 11.0   | 19.6   | 7.1    | 3.9    | 3.1    |
| 75°   | 1420.3 | 582.8  | 25.9   | 16.5   | 9.4    | 9.4    | 13.3   | 25.1   | 6.3    | 3.1    | 2.4    |
| 77.5° | 322.0  | 127.7  | 14.9   | 10.2   | 6.3    | 9.4    | 15.7   | 19.6   | 3.9    | 1.6    | 0.0    |
| 80°   | 78.3   | 31.3   | 9.4    | 6.3    | 3.9    | 7.1    | 11.8   | 11.0   | 0.8    | 0.0    | 0.0    |
| 82.5° | 25.9   | 11.0   | 3.9    | 3.1    | 0.8    | 2.4    | 5.5    | 3.1    | 0.0    | 0.0    | 0.0    |
| 85°   | 11.0   | 6.3    | 1.6    | 0.8    | 0.0    | 0.0    | 0.8    | 0.0    | 0.0    | 0.0    | 0.0    |
| 87.5° | 7.1    | 2.4    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

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

Report Prepared for

Cooper Lighting Solutions

McGRAW-EDISON

Report Number: SP1-1908-441-9-R4

Test Date: 10/23/2019

Luminaire Tested: SA1C-760-U-5WQ

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

### Test Information

Test Method: LM-79-2008  
 Report Number: SP1-1908-441-9-R4  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry:  $4\pi$   
 Issue Date: 10/28/2024  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: MCGRAW-EDISON  
 Catalog Number: **SA1C-760-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):                  | 5474   | CRI (Ra): | 71.7 |      |       |
| CIE u':                   | 0.2052 | R1:       | 70.6 | R9:  | -27.1 |
| CIE v':                   | 0.4804 | R2:       | 74.6 | R10: | 40.8  |
| Duv:                      | 0.0025 | R3:       | 78.3 | R11: | 74.6  |
| CIE x:                    | 0.3330 | R4:       | 73.8 | R12: | 50.4  |
| CIE y:                    | 0.3466 | R5:       | 72.4 | R13: | 70.0  |
| CIE z:                    | 0.3204 | R6:       | 67.5 | R14: | 87.8  |
| Peak Wavelength (nm):     | 442    | R7:       | 77.5 |      |       |
| Dominant Wavelength (nm): | 554    | R8:       | 58.9 |      |       |
| Purity:                   | 4.1    |           |      |      |       |
| Rf:                       | 72.1   |           |      |      |       |
| Rg:                       | 97.2   |           |      |      |       |



### Test Conditions

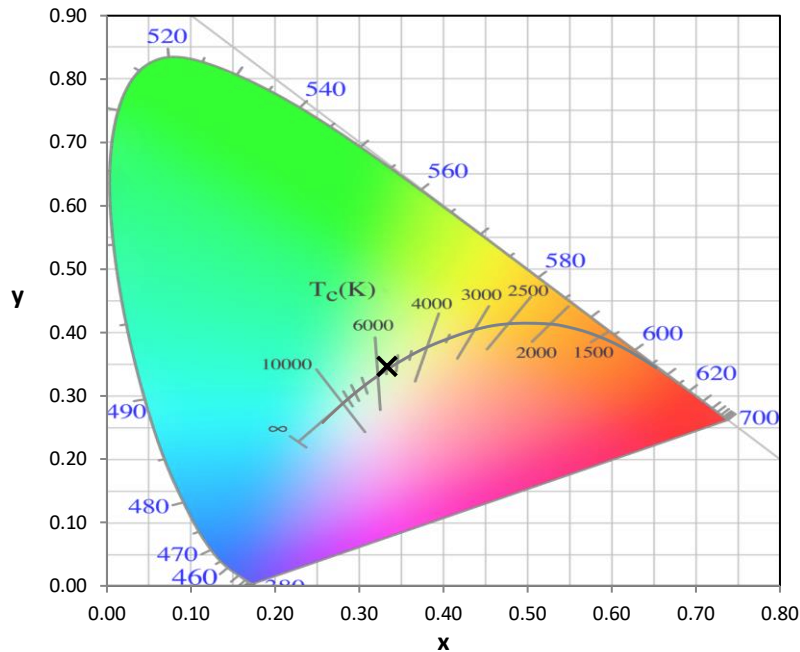
Stabilization Time: 240M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 24.6/31%  
 Sphere Temperature (°C): 25.9

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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 5700K 4-step quadrangle

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**Photopic Flux vs. Wavelength**



#####

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 3540             | NR               | 490       | 33363            | NR               | 620       | 80193            | NR               | 750       | 4663             | NR               | 880       | 4678             | NR               |
| 365       | 2862             | NR               | 495       | 44177            | NR               | 625       | 73091            | NR               | 755       | 4147             | NR               | 885       | 4128             | NR               |
| 370       | 2865             | NR               | 500       | 57019            | NR               | 630       | 66269            | NR               | 760       | 4040             | NR               | 890       | 4504             | NR               |
| 375       | 3254             | NR               | 505       | 70030            | NR               | 635       | 60012            | NR               | 765       | 3474             | NR               | 895       | 4371             | NR               |
| 380       | 3076             | NR               | 510       | 81972            | NR               | 640       | 53914            | NR               | 770       | 3469             | NR               | 900       | 4082             | NR               |
| 385       | 2904             | NR               | 515       | 92590            | NR               | 645       | 48385            | NR               | 775       | 3181             | NR               | 905       | 2982             | NR               |
| 390       | 2689             | NR               | 520       | 100305           | NR               | 650       | 43219            | NR               | 780       | 2969             | NR               | 910       | 4351             | NR               |
| 395       | 2619             | NR               | 525       | 107452           | NR               | 655       | 38562            | NR               | 785       | 3132             | NR               | 915       | 3365             | NR               |
| 400       | 2679             | NR               | 530       | 111373           | NR               | 660       | 34110            | NR               | 790       | 2507             | NR               | 920       | 3430             | NR               |
| 405       | 3515             | NR               | 535       | 114505           | NR               | 665       | 30085            | NR               | 795       | 2968             | NR               | 925       | 4264             | NR               |
| 410       | 6934             | NR               | 540       | 116408           | NR               | 670       | 26205            | NR               | 800       | 2758             | NR               | 930       | 4095             | NR               |
| 415       | 14943            | NR               | 545       | 118700           | NR               | 675       | 22906            | NR               | 805       | 2872             | NR               | 935       | 5048             | NR               |
| 420       | 31939            | NR               | 550       | 119209           | NR               | 680       | 20058            | NR               | 810       | 3094             | NR               | 940       | 4074             | NR               |
| 425       | 64701            | NR               | 555       | 120742           | NR               | 685       | 17413            | NR               | 815       | 3222             | NR               | 945       | 4949             | NR               |
| 430       | 110939           | NR               | 560       | 121594           | NR               | 690       | 15447            | NR               | 820       | 3238             | NR               | 950       | 4387             | NR               |
| 435       | 164597           | NR               | 565       | 121913           | NR               | 695       | 13398            | NR               | 825       | 3524             | NR               | 955       | 4978             | NR               |
| 440       | 207696           | NR               | 570       | 122147           | NR               | 700       | 11777            | NR               | 830       | 2921             | NR               | 960       | 4706             | NR               |
| 445       | 201830           | NR               | 575       | 121605           | NR               | 705       | 10412            | NR               | 835       | 3595             | NR               | 965       | 5083             | NR               |
| 450       | 145410           | NR               | 580       | 120248           | NR               | 710       | 9544             | NR               | 840       | 3016             | NR               | 970       | 4522             | NR               |
| 455       | 89594            | NR               | 585       | 117717           | NR               | 715       | 8940             | NR               | 845       | 4032             | NR               | 975       | 4740             | NR               |
| 460       | 58321            | NR               | 590       | 114359           | NR               | 720       | 7897             | NR               | 850       | 3579             | NR               | 980       | 6122             | NR               |
| 465       | 39318            | NR               | 595       | 109974           | NR               | 725       | 7045             | NR               | 855       | 4571             | NR               | 985       | 6450             | NR               |
| 470       | 27693            | NR               | 600       | 105269           | NR               | 730       | 6483             | NR               | 860       | 4485             | NR               | 990       | 4875             | NR               |
| 475       | 23081            | NR               | 605       | 99453            | NR               | 735       | 5838             | NR               | 865       | 3978             | NR               | 995       | 4764             | NR               |
| 480       | 23002            | NR               | 610       | 92921            | NR               | 740       | 5261             | NR               | 870       | 4298             | NR               | 1000      | 3640             | NR               |
| 485       | 26201            | NR               | 615       | 86989            | NR               | 745       | 4760             | NR               | 875       | 4356             | NR               |           |                  |                  |

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Scotopic Flux vs. Wavelength



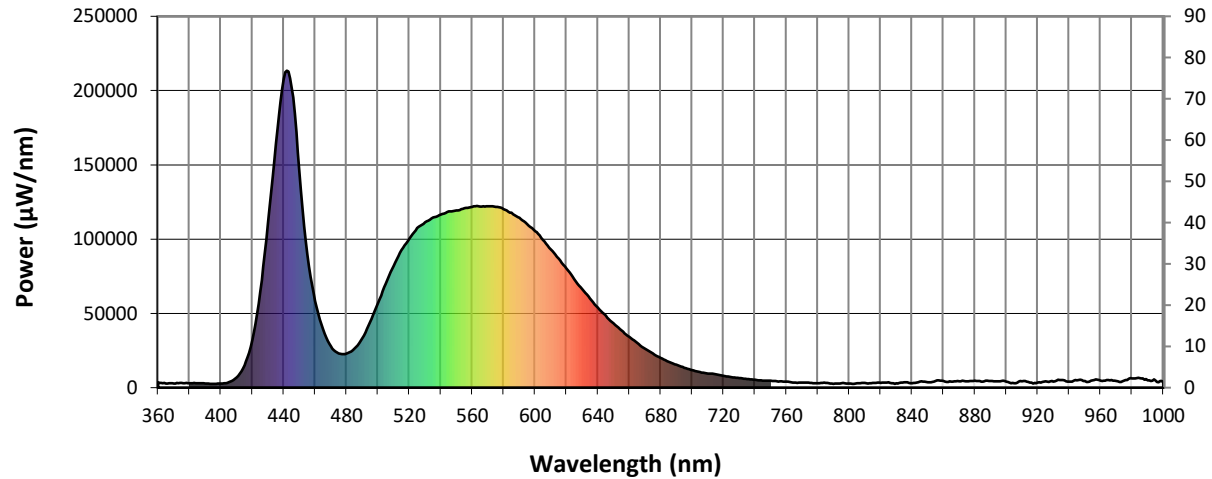
Scotopic Lumens: 13759.3

S/P: 1.85

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 3540             | NR               | 490       | 33363            | NR               | 620       | 80193            | NR               | 750       | 4663             | NR               | 880       | 4678             | NR               |
| 365       | 2862             | NR               | 495       | 44177            | NR               | 625       | 73091            | NR               | 755       | 4147             | NR               | 885       | 4128             | NR               |
| 370       | 2865             | NR               | 500       | 57019            | NR               | 630       | 66269            | NR               | 760       | 4040             | NR               | 890       | 4504             | NR               |
| 375       | 3254             | NR               | 505       | 70030            | NR               | 635       | 60012            | NR               | 765       | 3474             | NR               | 895       | 4371             | NR               |
| 380       | 3076             | NR               | 510       | 81972            | NR               | 640       | 53914            | NR               | 770       | 3469             | NR               | 900       | 4082             | NR               |
| 385       | 2904             | NR               | 515       | 92590            | NR               | 645       | 48385            | NR               | 775       | 3181             | NR               | 905       | 2982             | NR               |
| 390       | 2689             | NR               | 520       | 100305           | NR               | 650       | 43219            | NR               | 780       | 2969             | NR               | 910       | 4351             | NR               |
| 395       | 2619             | NR               | 525       | 107452           | NR               | 655       | 38562            | NR               | 785       | 3132             | NR               | 915       | 3365             | NR               |
| 400       | 2679             | NR               | 530       | 111373           | NR               | 660       | 34110            | NR               | 790       | 2507             | NR               | 920       | 3430             | NR               |
| 405       | 3515             | NR               | 535       | 114505           | NR               | 665       | 30085            | NR               | 795       | 2968             | NR               | 925       | 4264             | NR               |
| 410       | 6934             | NR               | 540       | 116408           | NR               | 670       | 26205            | NR               | 800       | 2758             | NR               | 930       | 4095             | NR               |
| 415       | 14943            | NR               | 545       | 118700           | NR               | 675       | 22906            | NR               | 805       | 2872             | NR               | 935       | 5048             | NR               |
| 420       | 31939            | NR               | 550       | 119209           | NR               | 680       | 20058            | NR               | 810       | 3094             | NR               | 940       | 4074             | NR               |
| 425       | 64701            | NR               | 555       | 120742           | NR               | 685       | 17413            | NR               | 815       | 3222             | NR               | 945       | 4949             | NR               |
| 430       | 110939           | NR               | 560       | 121594           | NR               | 690       | 15447            | NR               | 820       | 3238             | NR               | 950       | 4387             | NR               |
| 435       | 164597           | NR               | 565       | 121913           | NR               | 695       | 13398            | NR               | 825       | 3524             | NR               | 955       | 4978             | NR               |
| 440       | 207696           | NR               | 570       | 122147           | NR               | 700       | 11777            | NR               | 830       | 2921             | NR               | 960       | 4706             | NR               |
| 445       | 201830           | NR               | 575       | 121605           | NR               | 705       | 10412            | NR               | 835       | 3595             | NR               | 965       | 5083             | NR               |
| 450       | 145410           | NR               | 580       | 120248           | NR               | 710       | 9544             | NR               | 840       | 3016             | NR               | 970       | 4522             | NR               |
| 455       | 89594            | NR               | 585       | 117717           | NR               | 715       | 8940             | NR               | 845       | 4032             | NR               | 975       | 4740             | NR               |
| 460       | 58321            | NR               | 590       | 114359           | NR               | 720       | 7897             | NR               | 850       | 3579             | NR               | 980       | 6122             | NR               |
| 465       | 39318            | NR               | 595       | 109974           | NR               | 725       | 7045             | NR               | 855       | 4571             | NR               | 985       | 6450             | NR               |
| 470       | 27693            | NR               | 600       | 105269           | NR               | 730       | 6483             | NR               | 860       | 4485             | NR               | 990       | 4875             | NR               |
| 475       | 23081            | NR               | 605       | 99453            | NR               | 735       | 5838             | NR               | 865       | 3978             | NR               | 995       | 4764             | NR               |
| 480       | 23002            | NR               | 610       | 92921            | NR               | 740       | 5261             | NR               | 870       | 4298             | NR               | 1000      | 3640             | NR               |
| 485       | 26201            | NR               | 615       | 86989            | NR               | 745       | 4760             | NR               | 875       | 4356             | NR               |           |                  |                  |

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**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: 5527.6 M/P: 0.74**

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 3540             | NR               | 490       | 33363            | NR               | 620       | 80193            | NR               | 750       | 4663             | NR               | 880       | 4678             | NR               |
| 365       | 2862             | NR               | 495       | 44177            | NR               | 625       | 73091            | NR               | 755       | 4147             | NR               | 885       | 4128             | NR               |
| 370       | 2865             | NR               | 500       | 57019            | NR               | 630       | 66269            | NR               | 760       | 4040             | NR               | 890       | 4504             | NR               |
| 375       | 3254             | NR               | 505       | 70030            | NR               | 635       | 60012            | NR               | 765       | 3474             | NR               | 895       | 4371             | NR               |
| 380       | 3076             | NR               | 510       | 81972            | NR               | 640       | 53914            | NR               | 770       | 3469             | NR               | 900       | 4082             | NR               |
| 385       | 2904             | NR               | 515       | 92590            | NR               | 645       | 48385            | NR               | 775       | 3181             | NR               | 905       | 2982             | NR               |
| 390       | 2689             | NR               | 520       | 100305           | NR               | 650       | 43219            | NR               | 780       | 2969             | NR               | 910       | 4351             | NR               |
| 395       | 2619             | NR               | 525       | 107452           | NR               | 655       | 38562            | NR               | 785       | 3132             | NR               | 915       | 3365             | NR               |
| 400       | 2679             | NR               | 530       | 111373           | NR               | 660       | 34110            | NR               | 790       | 2507             | NR               | 920       | 3430             | NR               |
| 405       | 3515             | NR               | 535       | 114505           | NR               | 665       | 30085            | NR               | 795       | 2968             | NR               | 925       | 4264             | NR               |
| 410       | 6934             | NR               | 540       | 116408           | NR               | 670       | 26205            | NR               | 800       | 2758             | NR               | 930       | 4095             | NR               |
| 415       | 14943            | NR               | 545       | 118700           | NR               | 675       | 22906            | NR               | 805       | 2872             | NR               | 935       | 5048             | NR               |
| 420       | 31939            | NR               | 550       | 119209           | NR               | 680       | 20058            | NR               | 810       | 3094             | NR               | 940       | 4074             | NR               |
| 425       | 64701            | NR               | 555       | 120742           | NR               | 685       | 17413            | NR               | 815       | 3222             | NR               | 945       | 4949             | NR               |
| 430       | 110939           | NR               | 560       | 121594           | NR               | 690       | 15447            | NR               | 820       | 3238             | NR               | 950       | 4387             | NR               |
| 435       | 164597           | NR               | 565       | 121913           | NR               | 695       | 13398            | NR               | 825       | 3524             | NR               | 955       | 4978             | NR               |
| 440       | 207696           | NR               | 570       | 122147           | NR               | 700       | 11777            | NR               | 830       | 2921             | NR               | 960       | 4706             | NR               |
| 445       | 201830           | NR               | 575       | 121605           | NR               | 705       | 10412            | NR               | 835       | 3595             | NR               | 965       | 5083             | NR               |
| 450       | 145410           | NR               | 580       | 120248           | NR               | 710       | 9544             | NR               | 840       | 3016             | NR               | 970       | 4522             | NR               |
| 455       | 89594            | NR               | 585       | 117717           | NR               | 715       | 8940             | NR               | 845       | 4032             | NR               | 975       | 4740             | NR               |
| 460       | 58321            | NR               | 590       | 114359           | NR               | 720       | 7897             | NR               | 850       | 3579             | NR               | 980       | 6122             | NR               |
| 465       | 39318            | NR               | 595       | 109974           | NR               | 725       | 7045             | NR               | 855       | 4571             | NR               | 985       | 6450             | NR               |
| 470       | 27693            | NR               | 600       | 105269           | NR               | 730       | 6483             | NR               | 860       | 4485             | NR               | 990       | 4875             | NR               |
| 475       | 23081            | NR               | 605       | 99453            | NR               | 735       | 5838             | NR               | 865       | 3978             | NR               | 995       | 4764             | NR               |
| 480       | 23002            | NR               | 610       | 92921            | NR               | 740       | 5261             | NR               | 870       | 4298             | NR               | 1000      | 3640             | NR               |
| 485       | 26201            | NR               | 615       | 86989            | NR               | 745       | 4760             | NR               | 875       | 4356             | NR               |           |                  |                  |

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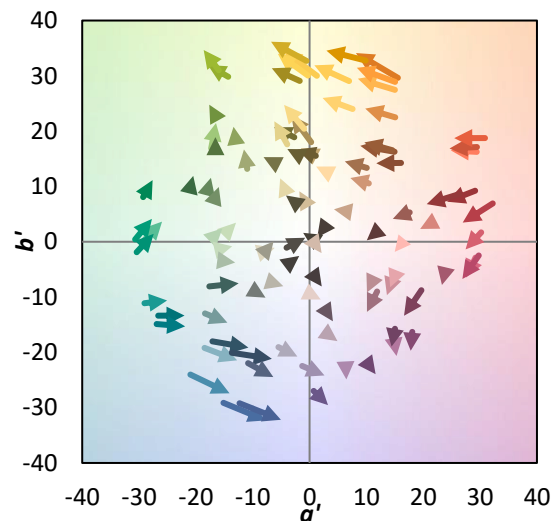
**TM-30-18**

**Summary**

$R_f = 72.1$   
 $R_g = 97.2$   
 CIE  $R_a = 71.7$   
 $R_g = -27.1$



**Color Vector Graphics**



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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 54 | CES51 = 88 | CES76 = 43 |
| CES02 = 59 | CES27 = 79 | CES52 = 90 | CES77 = 64 |
| CES03 = 30 | CES28 = 77 | CES53 = 77 | CES78 = 46 |
| CES04 = 69 | CES29 = 50 | CES54 = 81 | CES79 = 74 |
| CES05 = 46 | CES30 = 59 | CES55 = 80 | CES80 = 70 |
| CES06 = 50 | CES31 = 55 | CES56 = 70 | CES81 = 71 |
| CES07 = 38 | CES32 = 52 | CES57 = 68 | CES82 = 88 |
| CES08 = 38 | CES33 = 63 | CES58 = 70 | CES83 = 82 |
| CES09 = 29 | CES34 = 63 | CES59 = 88 | CES84 = 87 |
| CES10 = 72 | CES35 = 79 | CES60 = 92 | CES85 = 84 |
| CES11 = 55 | CES36 = 90 | CES61 = 88 | CES86 = 76 |
| CES12 = 61 | CES37 = 72 | CES62 = 81 | CES87 = 75 |
| CES13 = 41 | CES38 = 68 | CES63 = 75 | CES88 = 77 |
| CES14 = 74 | CES39 = 91 | CES64 = 72 | CES89 = 76 |
| CES15 = 70 | CES40 = 83 | CES65 = 65 | CES90 = 76 |
| CES16 = 46 | CES41 = 84 | CES66 = 66 | CES91 = 92 |
| CES17 = 48 | CES42 = 70 | CES67 = 64 | CES92 = 70 |
| CES18 = 55 | CES43 = 69 | CES68 = 71 | CES93 = 83 |
| CES19 = 70 | CES44 = 98 | CES69 = 80 | CES94 = 60 |
| CES20 = 64 | CES45 = 79 | CES70 = 58 | CES95 = 73 |
| CES21 = 85 | CES46 = 78 | CES71 = 55 | CES96 = 79 |
| CES22 = 77 | CES47 = 76 | CES72 = 84 | CES97 = 84 |
| CES23 = 91 | CES48 = 68 | CES73 = 47 | CES98 = 73 |
| CES24 = 90 | CES49 = 78 | CES74 = 94 | CES99 = 62 |
| CES25 = 71 | CES50 = 87 | CES75 = 51 |            |



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**TM-30-18**

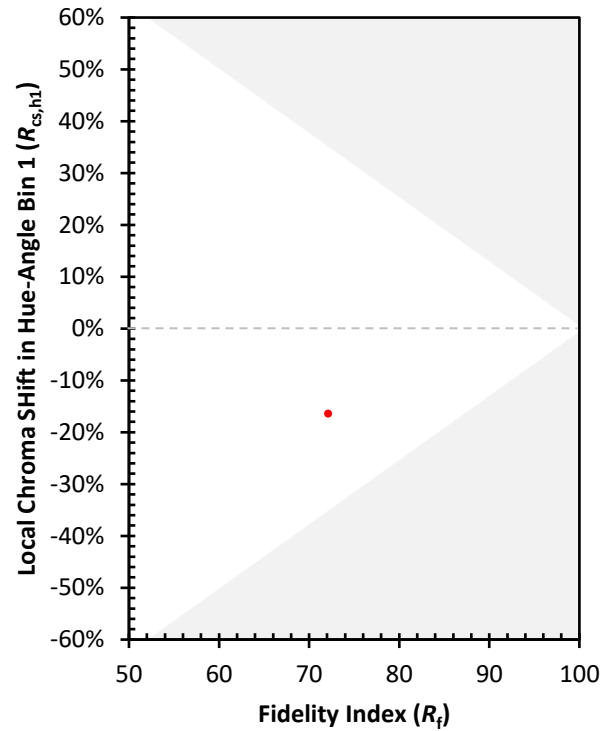
Color Rendition by Hue-Angle Bin



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**TM-30-18**

**Measure Comparisons**



(END OF REPORT)