

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: P319138

Luminaire Tested: **GLEON-SA4D-760-U-T4W**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P319138  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-18)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA4D-760-U-T4W  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(4) 70 CRI, 5700K, 1200mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE IV WIDE OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 31080 lumens  
Efficiency: N/A  
Efficacy: 120.5 lumens/watt  
Luminous Opening: Rectangular (W 1' x L: 1' x H: 0')  
IES Classification: Type IV - Short  
BUG Rating: B3 - U0 - G5

Input Watts (W): 258  
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

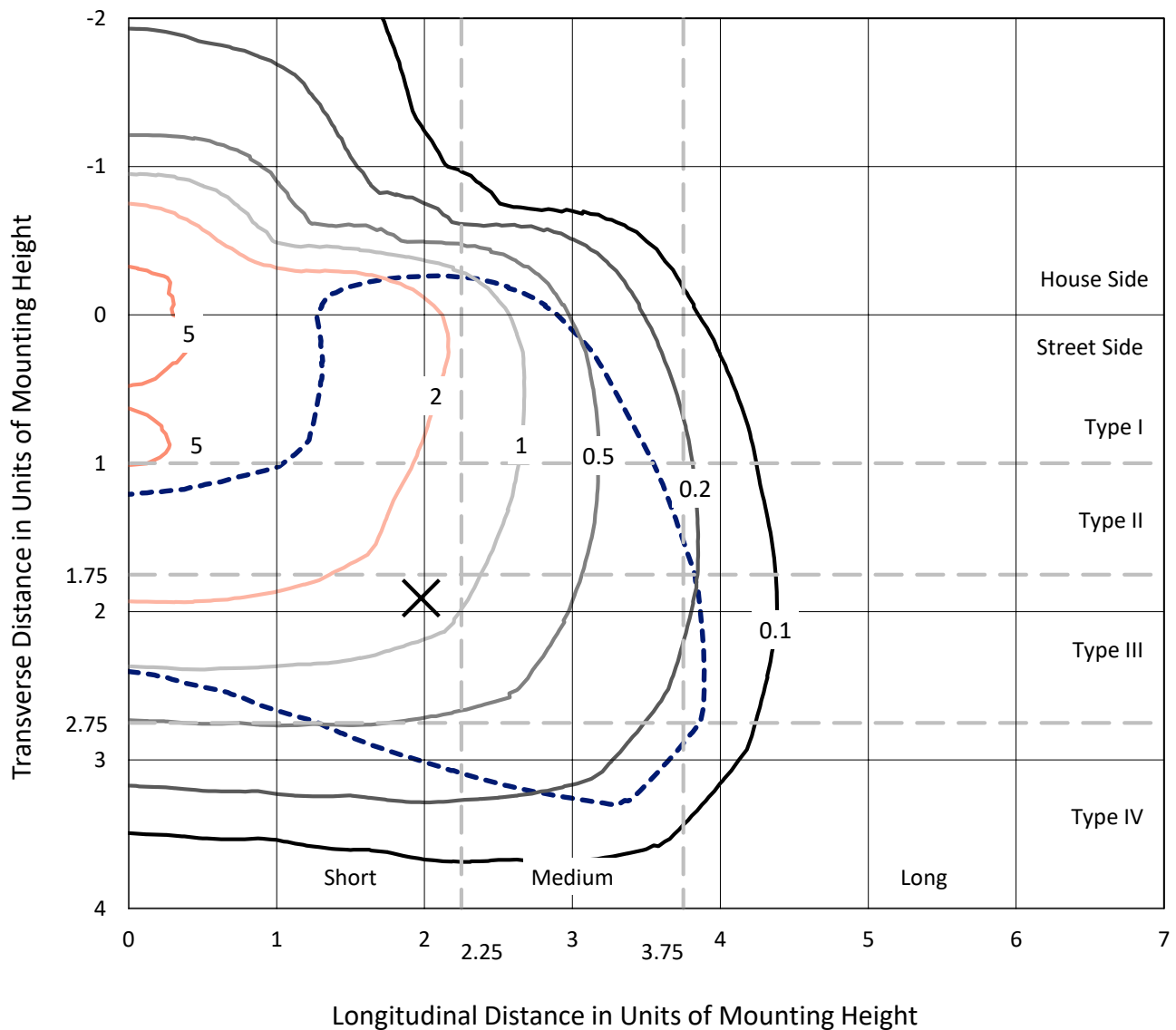


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## Iso-Footcandle Lines of Horizontal Illumination

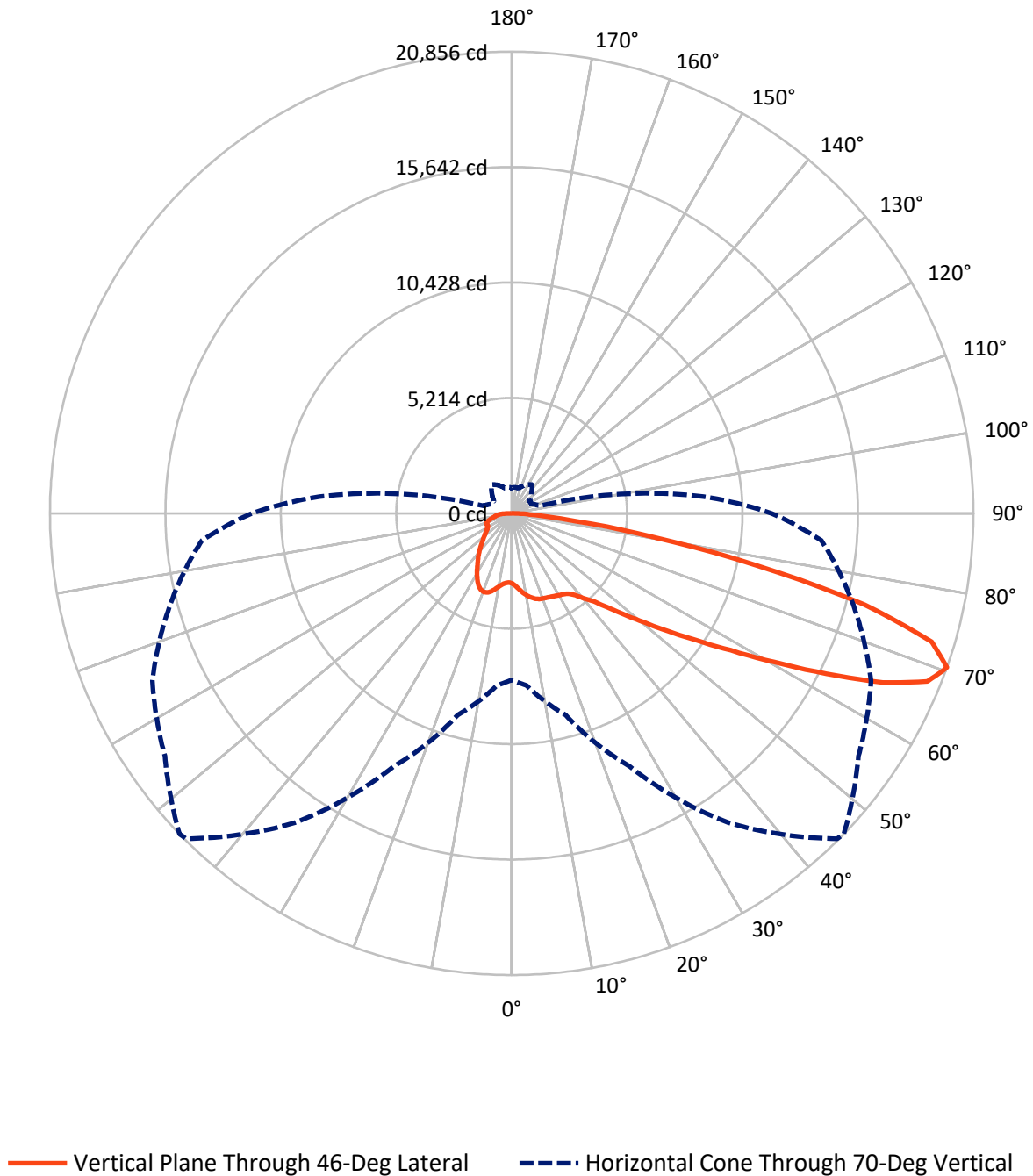
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 6.3 fc  
 Type IV - Short - N/A

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## Luminous Intensity Polar Plot



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CATALOG NUMBER: GLEON-SA4D-760-U-T4W

**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 7123.4   | 0.0    | 7123.4  |
|                    | % Fixture | 22.9     | 0.0    | 22.9    |
| <b>Street Side</b> | Lumens    | 23956.6  | 0.0    | 23956.6 |
|                    | % Fixture | 77.1     | 0.0    | 77.1    |
| <b>Total</b>       | Lumens    | 31080.0  | 0.0    | 31080.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 322.8   | 1.0       |
| 10°-20°   | 1075.5  | 3.5       |
| 20°-30°   | 1793.2  | 5.8       |
| 30°-40°   | 2544.7  | 8.2       |
| 40°-50°   | 3743.1  | 12.0      |
| 50°-60°   | 6338.9  | 20.4      |
| 60°-70°   | 8997.9  | 29.0      |
| 70°-80°   | 5466.3  | 17.6      |
| 80°-90°   | 797.7   | 2.6       |
| 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°    | 31080.0 | 100.0     |
| 0°-180°   | 31080.0 | 100.0     |

**Coefficient of Utilization**



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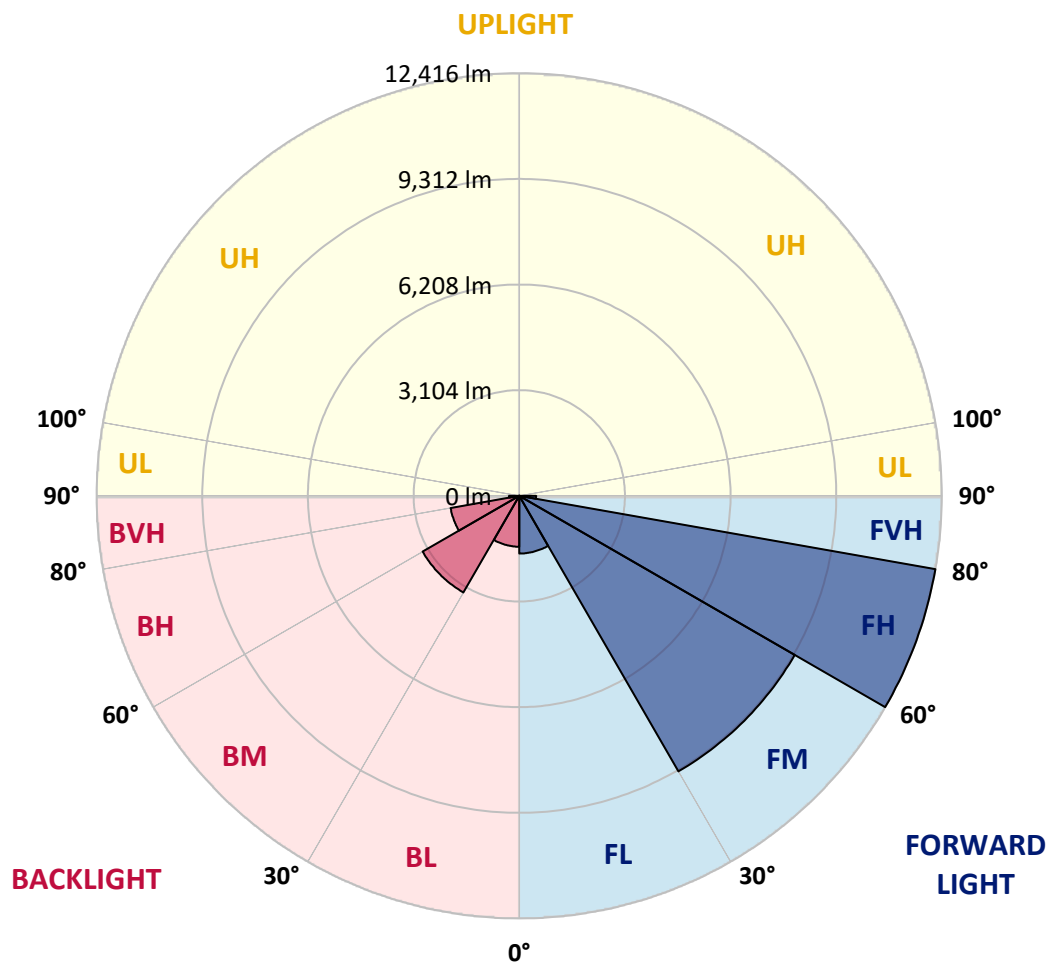
CATALOG NUMBER: GLEON-SA4D-760-U-T4W

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

| Zone |             | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|---------|-----------|-------------------------|------|---------|
|      |             |         |           | B                       | U    | G       |
| FL   | (0°-30°)    | 1695.9  | 5.5       |                         |      |         |
| FM   | (30°-60°)   | 9347.5  | 30.1      |                         |      |         |
| FH   | (60°-80°)   | 12416.3 | 39.9      |                         |      | G5      |
| FVH  | (80°-90°)   | 496.9   | 1.6       |                         |      | G3/500  |
| BL   | (0°-30°)    | 1495.6  | 4.8       | B3/2500                 |      |         |
| BM   | (30°-60°)   | 3279.1  | 10.6      | B3/5000                 |      |         |
| BH   | (60°-80°)   | 2047.9  | 6.6       | B3/2500                 |      | G3/2500 |
| BVH  | (80°-90°)   | 300.8   | 1.0       |                         |      | G3/500  |
| UL   | (90°-100°)  | 0.0     | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0     | 0.0       |                         | U0/0 |         |

**BUG Rating: B3-U0-G5**

Type IV Short





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 45°     | 46°     | 55°     | 65°     | 75°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 3166.4  | 3166.4  | 3166.4  | 3166.4  | 3166.4  | 3166.4  | 3166.4  | 3166.4  | 3166.4  | 3166.4  | 3166.4  |
| 2.5°  | 3324.9  | 3327.1  | 3331.3  | 3320.7  | 3290.9  | 3282.4  | 3279.2  | 3248.3  | 3228.1  | 3198.4  | 3172.8  |
| 5°    | 3590.8  | 3593.0  | 3586.6  | 3556.8  | 3490.9  | 3441.9  | 3437.7  | 3367.5  | 3303.7  | 3235.6  | 3184.5  |
| 7.5°  | 3868.4  | 3871.6  | 3851.4  | 3795.1  | 3702.5  | 3617.4  | 3612.1  | 3516.4  | 3419.6  | 3316.4  | 3239.8  |
| 10°   | 4114.1  | 4101.4  | 4068.4  | 3989.7  | 3880.1  | 3775.9  | 3771.7  | 3671.7  | 3560.0  | 3435.5  | 3333.4  |
| 12.5° | 4277.9  | 4267.3  | 4224.8  | 4129.0  | 4008.8  | 3913.1  | 3904.6  | 3812.1  | 3703.6  | 3567.4  | 3445.1  |
| 15°   | 4368.4  | 4375.8  | 4318.4  | 4209.9  | 4092.9  | 4012.0  | 4004.6  | 3938.6  | 3841.9  | 3704.6  | 3564.2  |
| 17.5° | 4380.1  | 4386.4  | 4331.1  | 4223.7  | 4128.0  | 4072.7  | 4069.5  | 4025.9  | 3955.7  | 3823.8  | 3677.0  |
| 20°   | 4312.0  | 4316.2  | 4270.5  | 4182.2  | 4119.5  | 4102.4  | 4101.4  | 4082.2  | 4030.1  | 3913.1  | 3770.6  |
| 22.5° | 4213.1  | 4216.3  | 4183.3  | 4119.5  | 4098.2  | 4124.8  | 4132.2  | 4124.8  | 4087.6  | 3978.0  | 3844.0  |
| 25°   | 4188.6  | 4186.5  | 4152.4  | 4087.6  | 4105.6  | 4162.0  | 4171.6  | 4174.8  | 4149.2  | 4053.5  | 3937.6  |
| 27.5° | 4306.7  | 4299.2  | 4234.3  | 4130.1  | 4141.8  | 4209.9  | 4222.6  | 4253.5  | 4237.5  | 4153.5  | 4043.9  |
| 30°   | 4648.1  | 4635.3  | 4502.4  | 4291.8  | 4234.3  | 4269.4  | 4285.4  | 4334.3  | 4337.5  | 4267.3  | 4185.4  |
| 32.5° | 5224.6  | 5208.6  | 4970.4  | 4593.8  | 4390.7  | 4330.1  | 4345.0  | 4418.3  | 4457.7  | 4403.5  | 4315.2  |
| 35°   | 5953.2  | 5935.1  | 5622.4  | 5107.6  | 4652.3  | 4446.0  | 4456.6  | 4515.1  | 4593.8  | 4517.3  | 4400.3  |
| 37.5° | 6712.6  | 6669.0  | 6368.0  | 5711.7  | 5068.2  | 4693.8  | 4693.8  | 4701.3  | 4738.5  | 4579.0  | 4500.2  |
| 40°   | 7467.8  | 7424.2  | 7151.9  | 6422.2  | 5606.4  | 5084.2  | 5059.7  | 4894.9  | 4865.1  | 4727.9  | 4701.3  |
| 42.5° | 8169.8  | 8157.0  | 7996.4  | 7225.3  | 6238.2  | 5468.2  | 5434.1  | 5154.4  | 5160.8  | 5075.7  | 5076.7  |
| 45°   | 8916.5  | 8916.5  | 8785.6  | 8035.8  | 6974.3  | 6085.1  | 6051.0  | 5639.4  | 5703.2  | 5663.9  | 5758.5  |
| 47.5° | 9525.9  | 9545.1  | 9527.0  | 8880.3  | 7830.5  | 6869.0  | 6807.3  | 6311.6  | 6490.3  | 6625.4  | 6900.9  |
| 50°   | 10148.1 | 10177.9 | 10181.1 | 9806.7  | 8865.4  | 7800.7  | 7730.5  | 7204.0  | 7602.9  | 7990.0  | 8531.4  |
| 52.5° | 11051.2 | 11118.2 | 10851.2 | 10731.0 | 10133.3 | 8906.9  | 8837.7  | 8351.7  | 9017.5  | 9561.0  | 10493.8 |
| 55°   | 11888.3 | 11829.8 | 11639.4 | 11713.8 | 11490.5 | 10166.2 | 10114.1 | 9687.6  | 10593.8 | 11300.1 | 12511.5 |
| 57.5° | 12341.4 | 12337.1 | 12528.6 | 12847.7 | 12954.0 | 11719.1 | 11675.5 | 11260.7 | 12371.1 | 12901.9 | 14405.9 |
| 60°   | 12873.2 | 12880.6 | 13355.0 | 14079.3 | 14517.6 | 13652.8 | 13633.7 | 13318.8 | 14097.4 | 14397.4 | 15891.8 |
| 62.5° | 12947.6 | 13081.7 | 13898.5 | 15145.1 | 15981.1 | 15912.0 | 15954.5 | 15172.8 | 15641.8 | 15590.8 | 17001.2 |
| 65°   | 12091.4 | 12268.0 | 13746.4 | 15467.4 | 17436.2 | 18382.8 | 18422.2 | 17037.3 | 16859.7 | 16610.8 | 17397.9 |
| 67.5° | 10336.4 | 10598.1 | 12204.2 | 14766.5 | 17915.9 | 20209.1 | 20264.4 | 18482.8 | 17870.1 | 16956.5 | 16442.7 |
| 70°   | 7522.0  | 7812.4  | 9429.1  | 12611.5 | 17060.7 | 20793.0 | 20855.8 | 19122.0 | 17908.4 | 15972.6 | 14036.8 |
| 72.5° | 4543.9  | 4771.5  | 6104.2  | 9284.5  | 14399.5 | 19729.4 | 19841.1 | 18311.6 | 16350.2 | 13529.4 | 10365.1 |
| 75°   | 1995.4  | 2144.3  | 2951.6  | 5350.1  | 10308.8 | 16323.6 | 16463.0 | 15673.7 | 13284.8 | 9832.2  | 6126.5  |
| 77.5° | 849.8   | 892.4   | 1210.4  | 2324.0  | 5827.7  | 11154.3 | 11345.8 | 11452.2 | 9013.2  | 5350.1  | 2588.9  |
| 80°   | 529.7   | 546.7   | 685.0   | 1051.9  | 2727.2  | 6264.8  | 6471.2  | 6738.1  | 4475.8  | 1966.7  | 904.1   |
| 82.5° | 322.3   | 341.4   | 455.2   | 636.1   | 1420.0  | 2839.9  | 2938.8  | 3127.1  | 1736.9  | 849.8   | 468.0   |
| 85°   | 193.6   | 207.4   | 278.7   | 402.1   | 808.4   | 1116.8  | 1115.8  | 1233.8  | 817.9   | 546.7   | 246.8   |
| 87.5° | 92.5    | 103.2   | 148.9   | 208.5   | 407.4   | 419.1   | 392.5   | 444.6   | 496.7   | 358.4   | 124.4   |
| 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: P319138

CATALOG NUMBER: GLEON-SA4D-760-U-T4W

**CANDELA DISTRIBUTION (continued):**

|       | 90°     | 95°     | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|---------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 3166.4  | 3166.4  | 3166.4 | 3166.4 | 3166.4 | 3166.4 | 3166.4 | 3166.4 | 3166.4 | 3166.4 | 3166.4 |
| 2.5°  | 3164.3  | 3160.1  | 3146.2 | 3135.6 | 3133.5 | 3127.1 | 3121.8 | 3125.0 | 3129.2 | 3130.3 | 3130.3 |
| 5°    | 3163.3  | 3151.6  | 3133.5 | 3126.0 | 3135.6 | 3148.4 | 3164.3 | 3185.6 | 3198.4 | 3207.9 | 3214.3 |
| 7.5°  | 3214.3  | 3192.0  | 3171.8 | 3167.5 | 3186.7 | 3220.7 | 3256.9 | 3301.5 | 3332.4 | 3353.6 | 3357.9 |
| 10°   | 3299.4  | 3271.7  | 3251.5 | 3255.8 | 3289.8 | 3338.8 | 3389.8 | 3447.2 | 3494.0 | 3522.8 | 3524.9 |
| 12.5° | 3397.3  | 3370.7  | 3351.5 | 3369.6 | 3426.0 | 3485.5 | 3538.7 | 3588.7 | 3631.3 | 3660.0 | 3660.0 |
| 15°   | 3510.0  | 3490.9  | 3468.5 | 3510.0 | 3586.6 | 3639.8 | 3662.1 | 3686.6 | 3710.0 | 3731.2 | 3727.0 |
| 17.5° | 3618.5  | 3600.4  | 3588.7 | 3637.6 | 3717.4 | 3741.9 | 3727.0 | 3708.9 | 3708.9 | 3720.6 | 3722.7 |
| 20°   | 3712.1  | 3696.1  | 3703.6 | 3751.4 | 3792.9 | 3767.4 | 3712.1 | 3654.7 | 3631.3 | 3637.6 | 3644.0 |
| 22.5° | 3794.0  | 3786.5  | 3808.9 | 3831.2 | 3801.4 | 3712.1 | 3610.0 | 3532.3 | 3503.6 | 3501.5 | 3503.6 |
| 25°   | 3889.7  | 3888.7  | 3916.3 | 3875.9 | 3744.0 | 3579.1 | 3441.9 | 3366.4 | 3350.5 | 3363.2 | 3384.5 |
| 27.5° | 4008.8  | 4020.5  | 4034.4 | 3886.5 | 3627.0 | 3378.1 | 3238.8 | 3186.7 | 3202.6 | 3233.5 | 3253.7 |
| 30°   | 4160.9  | 4192.9  | 4163.1 | 3859.9 | 3458.9 | 3148.4 | 3015.4 | 3000.5 | 3044.1 | 3087.7 | 3109.0 |
| 32.5° | 4308.8  | 4358.8  | 4286.5 | 3790.8 | 3242.0 | 2904.8 | 2801.6 | 2797.4 | 2850.5 | 2893.1 | 2922.9 |
| 35°   | 4427.9  | 4526.8  | 4379.0 | 3653.6 | 2990.9 | 2680.4 | 2604.8 | 2576.1 | 2595.3 | 2645.3 | 2679.3 |
| 37.5° | 4583.2  | 4748.1  | 4442.8 | 3444.1 | 2718.7 | 2495.3 | 2407.0 | 2341.1 | 2324.0 | 2344.3 | 2361.3 |
| 40°   | 4867.2  | 5085.2  | 4472.6 | 3151.6 | 2452.7 | 2310.2 | 2220.9 | 2124.1 | 2057.1 | 2008.1 | 2009.2 |
| 42.5° | 5330.9  | 5524.5  | 4453.4 | 2796.3 | 2207.0 | 2129.4 | 2028.4 | 1916.7 | 1808.2 | 1697.6 | 1689.1 |
| 45°   | 6084.0  | 6177.6  | 4396.0 | 2419.8 | 1991.1 | 1940.1 | 1845.4 | 1733.7 | 1589.1 | 1463.6 | 1451.9 |
| 47.5° | 7289.1  | 7081.7  | 4306.7 | 2091.1 | 1800.7 | 1779.5 | 1692.2 | 1563.5 | 1410.4 | 1309.3 | 1300.8 |
| 50°   | 8932.4  | 8386.8  | 4263.1 | 1829.5 | 1632.7 | 1639.1 | 1567.8 | 1431.7 | 1287.0 | 1212.5 | 1204.0 |
| 52.5° | 10898.0 | 9906.7  | 4347.1 | 1627.4 | 1497.6 | 1519.9 | 1466.8 | 1339.1 | 1217.9 | 1159.4 | 1150.9 |
| 55°   | 12937.0 | 11480.9 | 4437.5 | 1480.6 | 1370.0 | 1413.6 | 1395.5 | 1290.2 | 1180.6 | 1126.4 | 1118.9 |
| 57.5° | 14682.4 | 12656.2 | 4256.7 | 1361.5 | 1256.2 | 1324.2 | 1340.2 | 1259.3 | 1161.5 | 1112.6 | 1104.1 |
| 60°   | 15781.2 | 13129.5 | 3782.3 | 1249.8 | 1165.7 | 1253.0 | 1308.3 | 1250.8 | 1168.9 | 1164.7 | 1158.3 |
| 62.5° | 16302.3 | 13088.0 | 3070.7 | 1161.5 | 1109.4 | 1222.1 | 1331.7 | 1298.7 | 1254.0 | 1292.3 | 1295.5 |
| 65°   | 16068.3 | 12462.6 | 2286.8 | 1103.0 | 1069.0 | 1233.8 | 1401.9 | 1389.1 | 1278.5 | 1316.8 | 1322.1 |
| 67.5° | 14528.2 | 10970.3 | 1693.3 | 1051.9 | 1024.3 | 1266.8 | 1529.5 | 1418.9 | 1230.6 | 1258.3 | 1241.3 |
| 70°   | 11742.5 | 8697.3  | 1306.1 | 994.5  | 978.5  | 1262.5 | 1586.9 | 1400.8 | 1178.5 | 1184.9 | 1139.2 |
| 72.5° | 8097.5  | 5930.8  | 1062.6 | 941.3  | 912.6  | 1150.9 | 1546.5 | 1356.1 | 1134.9 | 1086.0 | 1025.3 |
| 75°   | 4403.5  | 3183.5  | 903.0  | 886.0  | 796.7  | 1010.5 | 1472.1 | 1324.2 | 1095.5 | 1030.7 | 996.6  |
| 77.5° | 1732.7  | 1321.0  | 783.9  | 810.5  | 696.7  | 892.4  | 1389.1 | 1263.6 | 1041.3 | 956.2  | 939.2  |
| 80°   | 707.3   | 674.3   | 649.9  | 700.9  | 598.8  | 780.7  | 1289.1 | 1192.3 | 976.4  | 887.1  | 853.0  |
| 82.5° | 401.0   | 419.1   | 505.2  | 553.1  | 486.1  | 719.0  | 1241.3 | 1134.9 | 898.8  | 794.5  | 754.1  |
| 85°   | 205.3   | 245.7   | 352.1  | 396.7  | 357.4  | 611.6  | 1143.4 | 993.4  | 721.1  | 608.4  | 611.6  |
| 87.5° | 98.9    | 137.2   | 222.3  | 248.9  | 231.9  | 442.5  | 854.1  | 720.1  | 561.6  | 444.6  | 430.8  |
| 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

REPORT NUMBER: SP1-1908-441-9-R4

| 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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**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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Color Rendition by Hue-Angle Bin



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**Measure Comparisons**



(END OF REPORT)