

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: P317959

Luminaire Tested: **GLEON-SA5B-722-U-T3R**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P317959  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-10)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA5B-722-U-T3R  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(5) 70 CRI, 2200K, 800mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE III  
ROADWAY OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 21468 lumens  
Efficiency: N/A  
Efficacy: 102.2 lumens/watt  
Luminous Opening: Rectangular (W 1.5' x L: 1' x H: 0')  
IES Classification: Type IV - Medium  
BUG Rating: B3 - U0 - G4

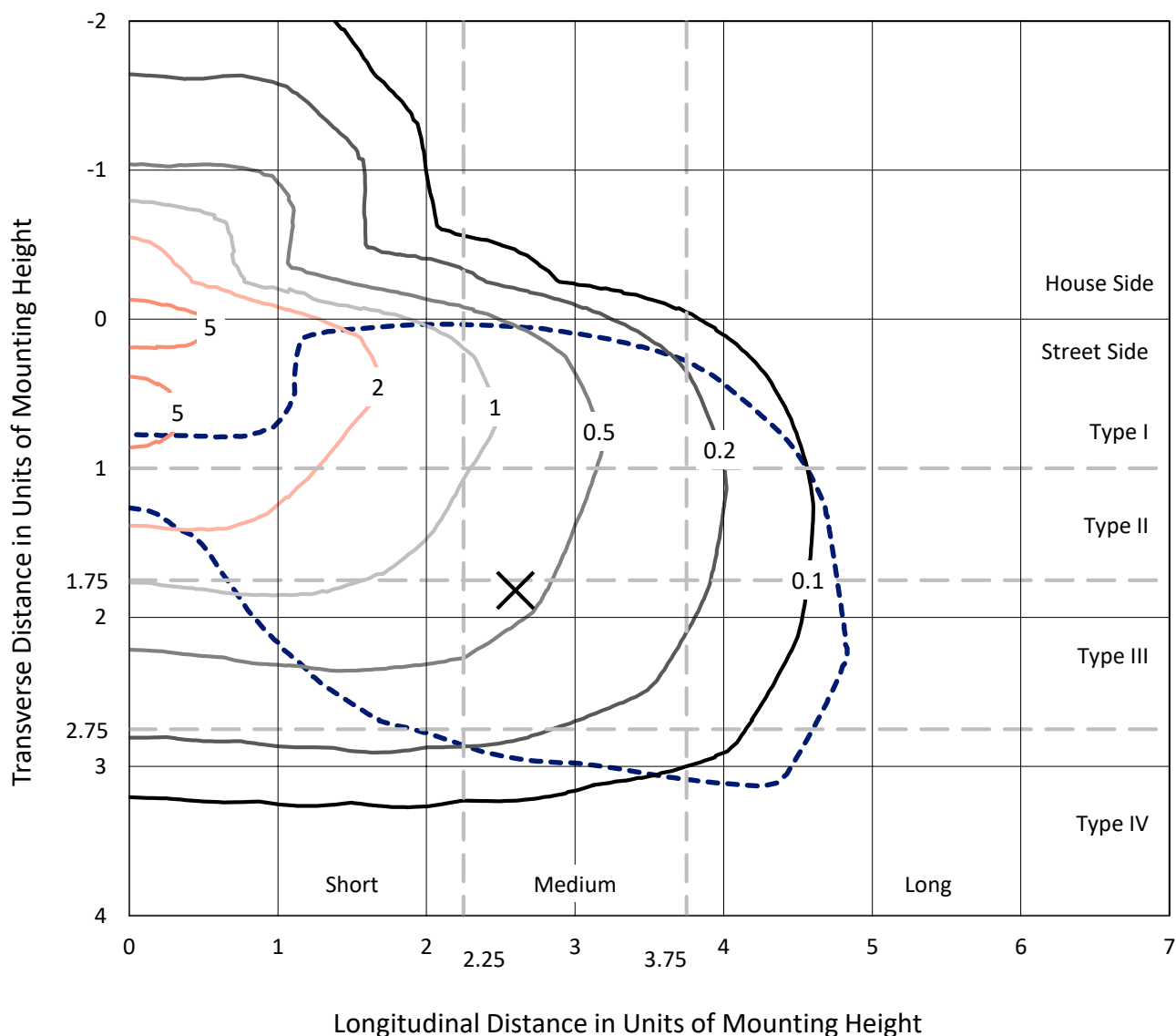
Input Watts (W): 210  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



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## Iso-Footcandle Lines of Horizontal Illumination

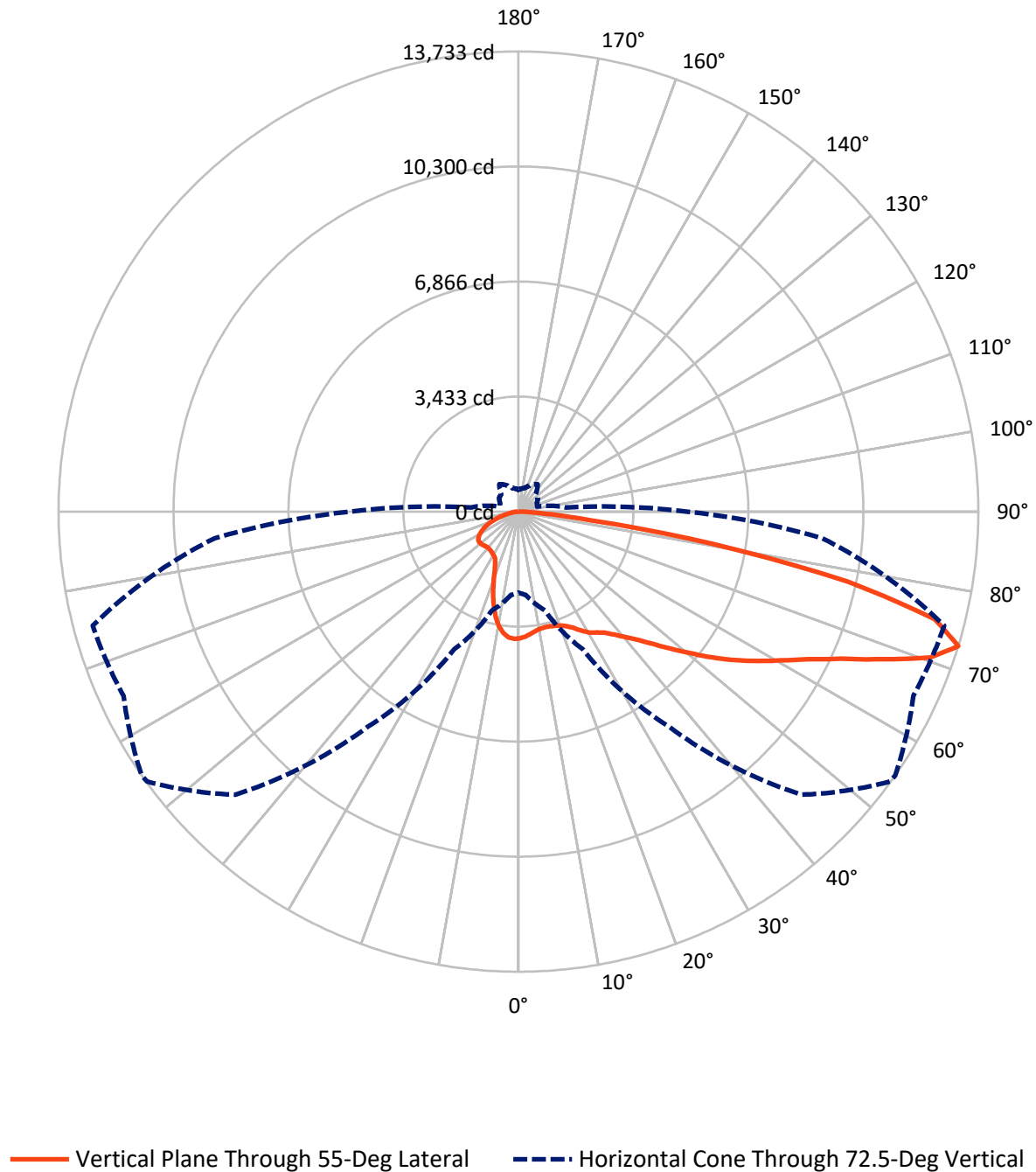
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 6.1 fc  
 Type IV - Medium - N/A

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## Luminous Intensity Polar Plot



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CATALOG NUMBER: GLEON-SA5B-722-U-T3R

**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 3990.2   | 0.0    | 3990.2  |
|                    | % Fixture | 18.6     | 0.0    | 18.6    |
| <b>Street Side</b> | Lumens    | 17477.8  | 0.0    | 17477.8 |
|                    | % Fixture | 81.4     | 0.0    | 81.4    |
| <b>Total</b>       | Lumens    | 21468.0  | 0.0    | 21468.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 342.6   | 1.6       |
| 10°-20°   | 912.2   | 4.2       |
| 20°-30°   | 1504.0  | 7.0       |
| 30°-40°   | 2224.8  | 10.4      |
| 40°-50°   | 3105.4  | 14.5      |
| 50°-60°   | 4043.3  | 18.8      |
| 60°-70°   | 4969.1  | 23.1      |
| 70°-80°   | 3895.2  | 18.1      |
| 80°-90°   | 471.4   | 2.2       |
| 90°-100°  | 0.0     | 0.0       |
| 100°-110° | 0.0     | 0.0       |
| 110°-120° | 0.0     | 0.0       |
| 120°-130° | 0.0     | 0.0       |
| 130°-140° | 0.0     | 0.0       |
| 140°-150° | 0.0     | 0.0       |
| 150°-160° | 0.0     | 0.0       |
| 160°-170° | 0.0     | 0.0       |
| 170°-180° | 0.0     | 0.0       |
| 0°-90°    | 21468.0 | 100.0     |
| 0°-180°   | 21468.0 | 100.0     |

**Coefficient of Utilization**



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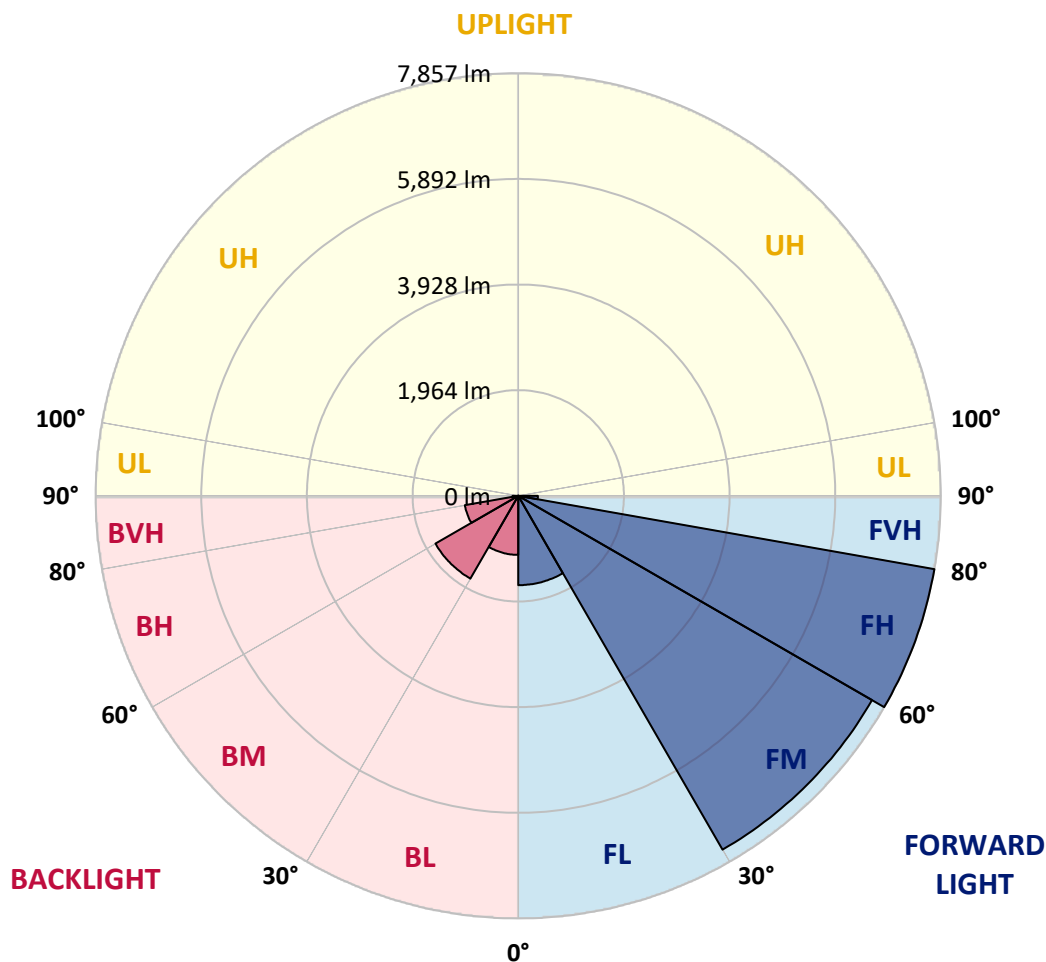
CATALOG NUMBER: GLEON-SA5B-722-U-T3R

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |          |
|------|-------------|--------|-----------|-------------------------|------|----------|
|      |             |        |           | B                       | U    | G        |
| FL   | (0°-30°)    | 1661.0 | 7.7       |                         |      |          |
| FM   | (30°-60°)   | 7595.8 | 35.4      |                         |      |          |
| FH   | (60°-80°)   | 7856.6 | 36.6      |                         |      | G4/12000 |
| FVH  | (80°-90°)   | 364.4  | 1.7       |                         |      | G3/500   |
| BL   | (0°-30°)    | 1097.9 | 5.1       | B3/2500                 |      |          |
| BM   | (30°-60°)   | 1777.7 | 8.3       | B2/2500                 |      |          |
| BH   | (60°-80°)   | 1007.7 | 4.7       | B3/2500                 |      | G3/2500  |
| BVH  | (80°-90°)   | 106.9  | 0.5       |                         |      | G2/225   |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |          |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |          |

**BUG Rating: B3-U0-G4**

Type IV Medium



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°     | 54°     | 55°     | 65°     | 75°     | 85°    |
|-------|--------|--------|--------|--------|--------|---------|---------|---------|---------|---------|--------|
| 0°    | 3786.5 | 3786.5 | 3786.5 | 3786.5 | 3786.5 | 3786.5  | 3786.5  | 3786.5  | 3786.5  | 3786.5  | 3786.5 |
| 2.5°  | 3663.2 | 3654.5 | 3665.4 | 3680.6 | 3697.3 | 3719.8  | 3732.8  | 3738.6  | 3761.1  | 3769.8  | 3788.7 |
| 5°    | 3493.6 | 3489.2 | 3507.3 | 3533.4 | 3570.4 | 3622.6  | 3664.7  | 3672.7  | 3732.1  | 3774.2  | 3812.6 |
| 7.5°  | 3370.3 | 3370.3 | 3391.3 | 3422.5 | 3463.8 | 3534.2  | 3593.6  | 3604.5  | 3705.3  | 3795.9  | 3867.0 |
| 10°   | 3272.4 | 3276.0 | 3300.7 | 3337.7 | 3386.2 | 3460.9  | 3540.0  | 3552.3  | 3698.0  | 3846.7  | 3959.8 |
| 12.5° | 3207.1 | 3215.8 | 3238.3 | 3271.7 | 3331.9 | 3422.5  | 3522.6  | 3539.2  | 3713.3  | 3919.2  | 4071.5 |
| 15°   | 3248.5 | 3263.0 | 3265.1 | 3278.9 | 3312.3 | 3410.9  | 3532.7  | 3550.1  | 3745.9  | 3993.1  | 4198.4 |
| 17.5° | 3429.7 | 3434.8 | 3412.3 | 3383.3 | 3367.4 | 3430.5  | 3563.2  | 3581.3  | 3785.0  | 4066.4  | 4320.2 |
| 20°   | 3705.3 | 3702.4 | 3653.8 | 3575.5 | 3494.3 | 3504.4  | 3613.2  | 3632.0  | 3838.0  | 4130.9  | 4442.0 |
| 22.5° | 4053.3 | 4043.2 | 3968.5 | 3824.2 | 3685.7 | 3627.7  | 3700.9  | 3716.9  | 3917.7  | 4223.0  | 4572.5 |
| 25°   | 4475.3 | 4452.9 | 4354.2 | 4160.6 | 3956.9 | 3807.5  | 3832.9  | 3848.1  | 4033.8  | 4326.0  | 4692.1 |
| 27.5° | 4920.6 | 4898.1 | 4772.6 | 4538.4 | 4267.2 | 4034.5  | 4014.9  | 4028.0  | 4165.7  | 4402.1  | 4780.6 |
| 30°   | 5386.1 | 5362.1 | 5247.6 | 4985.1 | 4596.4 | 4269.4  | 4184.6  | 4189.7  | 4258.5  | 4443.4  | 4853.1 |
| 32.5° | 5853.8 | 5831.3 | 5702.9 | 5398.4 | 4953.9 | 4521.7  | 4307.1  | 4300.6  | 4314.4  | 4486.2  | 4935.1 |
| 35°   | 6328.0 | 6336.7 | 6186.6 | 5849.4 | 5349.8 | 4802.4  | 4452.1  | 4438.4  | 4407.9  | 4574.0  | 5051.1 |
| 37.5° | 6835.6 | 6829.8 | 6635.4 | 6283.0 | 5763.9 | 5106.9  | 4660.2  | 4658.1  | 4552.9  | 4740.0  | 5233.1 |
| 40°   | 7174.9 | 7178.5 | 7060.3 | 6726.8 | 6182.2 | 5444.1  | 4927.1  | 4922.0  | 4784.2  | 4988.7  | 5471.6 |
| 42.5° | 7307.6 | 7331.5 | 7362.0 | 7150.3 | 6620.2 | 5834.9  | 5245.4  | 5238.2  | 5106.9  | 5345.5  | 5752.3 |
| 45°   | 7317.0 | 7364.9 | 7553.4 | 7526.6 | 7064.0 | 6282.3  | 5652.2  | 5631.9  | 5537.6  | 5819.7  | 6087.2 |
| 47.5° | 7235.8 | 7285.1 | 7598.4 | 7750.6 | 7460.6 | 6754.3  | 6127.9  | 6111.9  | 6030.7  | 6412.8  | 6449.8 |
| 50°   | 7058.2 | 7105.3 | 7505.6 | 7860.1 | 7786.9 | 7208.3  | 6676.0  | 6634.0  | 6590.5  | 7098.0  | 6864.6 |
| 52.5° | 6725.3 | 6816.0 | 7381.6 | 7886.2 | 7981.9 | 7611.4  | 7252.5  | 7224.9  | 7248.9  | 7821.0  | 7280.0 |
| 55°   | 5937.2 | 6038.7 | 7061.8 | 7864.5 | 8126.2 | 7950.0  | 7828.9  | 7827.5  | 7951.5  | 8579.4  | 7726.0 |
| 57.5° | 5495.6 | 5567.3 | 6410.6 | 7827.5 | 8297.4 | 8286.5  | 8399.6  | 8413.4  | 8654.8  | 9405.3  | 8193.0 |
| 60°   | 5246.1 | 5321.5 | 6080.7 | 7690.5 | 8562.8 | 8721.6  | 8981.9  | 9009.4  | 9369.8  | 10319.7 | 8754.9 |
| 62.5° | 5019.2 | 5101.8 | 5876.2 | 7411.3 | 8875.3 | 9343.7  | 9679.4  | 9704.1  | 10126.8 | 11259.4 | 9298.0 |
| 65°   | 4631.2 | 4724.8 | 5576.8 | 7227.8 | 9159.5 | 10155.1 | 10566.2 | 10582.9 | 10996.2 | 12244.1 | 9713.5 |
| 67.5° | 4083.1 | 4168.6 | 5011.9 | 6822.5 | 9369.8 | 11140.5 | 11745.2 | 11754.7 | 11858.4 | 12939.5 | 9925.9 |
| 70°   | 3442.8 | 3475.4 | 4207.1 | 5985.7 | 9121.1 | 12062.1 | 13037.4 | 13039.5 | 12644.4 | 13384.7 | 9891.1 |
| 72.5° | 2418.9 | 2495.8 | 3054.1 | 4531.2 | 7838.4 | 11949.7 | 13708.1 | 13732.7 | 13009.8 | 13159.9 | 9100.8 |
| 75°   | 1483.6 | 1564.8 | 1915.7 | 2746.0 | 4972.8 | 9398.1  | 12665.4 | 12836.5 | 12324.6 | 11733.6 | 7434.5 |
| 77.5° | 991.9  | 1022.4 | 1250.1 | 1601.0 | 2252.9 | 5407.1  | 9737.4  | 10059.4 | 10238.5 | 8557.0  | 4754.5 |
| 80°   | 553.3  | 611.3  | 828.8  | 994.8  | 1002.1 | 2148.5  | 5838.5  | 5913.9  | 5696.4  | 3407.3  | 1466.9 |
| 82.5° | 292.9  | 324.8  | 553.3  | 584.4  | 546.7  | 719.3   | 2176.0  | 2178.2  | 1820.0  | 913.6   | 435.8  |
| 85°   | 227.0  | 253.8  | 379.2  | 356.8  | 279.2  | 319.0   | 717.9   | 757.0   | 619.2   | 374.2   | 142.1  |
| 87.5° | 113.1  | 140.7  | 257.4  | 226.2  | 109.5  | 91.4    | 256.7   | 274.1   | 244.4   | 146.5   | 51.5   |
| 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: P317959

CATALOG NUMBER: GLEON-SA5B-722-U-T3R

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 3786.5 | 3786.5 | 3786.5 | 3786.5 | 3786.5 | 3786.5 | 3786.5 | 3786.5 | 3786.5 | 3786.5 | 3786.5 |
| 2.5°  | 3795.9 | 3802.4 | 3810.4 | 3801.7 | 3798.8 | 3787.2 | 3767.6 | 3763.3 | 3753.1 | 3753.9 | 3759.7 |
| 5°    | 3829.3 | 3840.2 | 3835.8 | 3802.4 | 3762.6 | 3706.7 | 3648.7 | 3599.4 | 3566.8 | 3564.6 | 3562.4 |
| 7.5°  | 3893.1 | 3900.3 | 3866.3 | 3771.3 | 3659.6 | 3530.5 | 3408.7 | 3302.1 | 3237.6 | 3221.6 | 3218.0 |
| 10°   | 3993.1 | 3991.7 | 3898.2 | 3706.7 | 3484.1 | 3253.5 | 3057.8 | 2909.8 | 2823.6 | 2798.2 | 2791.7 |
| 12.5° | 4104.8 | 4088.1 | 3909.0 | 3589.3 | 3236.1 | 2916.4 | 2668.4 | 2503.8 | 2413.9 | 2384.9 | 2377.6 |
| 15°   | 4220.1 | 4178.8 | 3882.2 | 3413.8 | 2931.6 | 2553.1 | 2292.8 | 2140.5 | 2091.9 | 2076.0 | 2073.1 |
| 17.5° | 4327.4 | 4247.7 | 3805.3 | 3176.0 | 2584.3 | 2191.3 | 1988.2 | 1927.3 | 1938.9 | 1960.0 | 1960.7 |
| 20°   | 4432.6 | 4294.1 | 3682.1 | 2875.8 | 2218.1 | 1893.2 | 1824.4 | 1869.3 | 1924.4 | 1967.2 | 1973.0 |
| 22.5° | 4536.3 | 4326.7 | 3523.3 | 2529.2 | 1890.3 | 1725.7 | 1774.3 | 1856.3 | 1919.4 | 1965.8 | 1973.7 |
| 25°   | 4623.3 | 4334.7 | 3304.3 | 2159.4 | 1662.7 | 1662.7 | 1750.4 | 1828.0 | 1890.3 | 1936.0 | 1944.0 |
| 27.5° | 4655.2 | 4281.0 | 2995.4 | 1817.1 | 1548.1 | 1633.7 | 1717.0 | 1781.6 | 1834.5 | 1883.1 | 1891.8 |
| 30°   | 4667.5 | 4181.7 | 2638.7 | 1542.3 | 1501.0 | 1602.5 | 1672.1 | 1727.2 | 1777.2 | 1822.9 | 1830.9 |
| 32.5° | 4669.7 | 4062.0 | 2260.1 | 1386.4 | 1468.3 | 1569.9 | 1616.3 | 1664.8 | 1718.5 | 1736.6 | 1739.5 |
| 35°   | 4683.4 | 3920.6 | 1861.3 | 1306.6 | 1437.9 | 1539.4 | 1576.4 | 1611.2 | 1524.2 | 1530.7 | 1536.5 |
| 37.5° | 4723.3 | 3780.7 | 1527.8 | 1261.7 | 1418.3 | 1523.4 | 1567.7 | 1441.5 | 1373.3 | 1357.4 | 1355.2 |
| 40°   | 4798.0 | 3631.3 | 1280.5 | 1225.4 | 1411.1 | 1531.4 | 1511.8 | 1345.8 | 1228.3 | 1140.6 | 1127.5 |
| 42.5° | 4901.7 | 3470.3 | 1122.5 | 1201.5 | 1416.1 | 1569.9 | 1434.3 | 1253.7 | 1058.7 | 1002.1 | 994.8  |
| 45°   | 5018.4 | 3301.4 | 1036.9 | 1184.8 | 1433.5 | 1599.6 | 1418.3 | 1131.2 | 979.6  | 936.8  | 933.2  |
| 47.5° | 5131.6 | 3094.7 | 992.7  | 1177.6 | 1457.5 | 1575.7 | 1350.9 | 1093.5 | 941.9  | 919.4  | 921.6  |
| 50°   | 5261.4 | 2908.4 | 965.8  | 1169.6 | 1478.5 | 1560.4 | 1274.7 | 1073.9 | 927.4  | 955.0  | 984.0  |
| 52.5° | 5370.8 | 2715.5 | 941.9  | 1153.6 | 1486.5 | 1533.6 | 1255.2 | 1077.5 | 927.4  | 980.3  | 1007.9 |
| 55°   | 5500.6 | 2569.8 | 914.4  | 1120.3 | 1471.2 | 1457.5 | 1241.4 | 1099.3 | 938.3  | 904.9  | 907.8  |
| 57.5° | 5668.1 | 2521.9 | 883.9  | 1068.1 | 1420.5 | 1346.5 | 1234.9 | 1120.3 | 931.8  | 910.7  | 918.0  |
| 60°   | 5900.2 | 2572.7 | 871.6  | 999.9  | 1341.4 | 1259.5 | 1235.6 | 1109.4 | 886.1  | 849.8  | 850.5  |
| 62.5° | 6121.3 | 2629.2 | 870.8  | 957.1  | 1244.3 | 1181.9 | 1218.9 | 1073.9 | 862.9  | 841.8  | 849.8  |
| 65°   | 6193.8 | 2571.9 | 836.0  | 909.3  | 1134.8 | 1089.1 | 1188.4 | 1036.2 | 845.5  | 813.6  | 812.1  |
| 67.5° | 6096.7 | 2394.3 | 765.7  | 831.7  | 1009.3 | 981.1  | 1148.6 | 991.2  | 817.9  | 791.8  | 787.5  |
| 70°   | 5808.1 | 1997.7 | 678.7  | 729.5  | 866.5  | 859.2  | 1085.5 | 939.0  | 780.9  | 758.5  | 739.6  |
| 72.5° | 5031.5 | 1423.4 | 572.1  | 606.9  | 705.5  | 728.7  | 998.5  | 870.8  | 728.7  | 680.1  | 651.1  |
| 75°   | 4132.4 | 1053.6 | 469.9  | 477.1  | 535.9  | 598.9  | 878.8  | 791.1  | 667.1  | 584.4  | 562.0  |
| 77.5° | 2530.6 | 644.6  | 374.2  | 377.1  | 384.3  | 477.8  | 723.7  | 701.9  | 588.8  | 487.3  | 471.3  |
| 80°   | 819.4  | 351.7  | 270.5  | 284.2  | 262.5  | 350.2  | 559.8  | 597.5  | 505.4  | 407.5  | 390.1  |
| 82.5° | 311.8  | 205.2  | 182.7  | 192.2  | 182.0  | 234.9  | 408.2  | 478.6  | 414.0  | 335.0  | 272.6  |
| 85°   | 150.8  | 116.0  | 108.0  | 121.1  | 112.4  | 120.4  | 261.0  | 352.4  | 314.0  | 218.3  | 203.0  |
| 87.5° | 53.7   | 51.5   | 41.3   | 55.8   | 47.9   | 42.8   | 79.8   | 177.7  | 207.4  | 150.1  | 134.1  |
| 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: SP1-1908-441-10-R4

Test Date: 10/25/2019

Luminaire Tested: SA1C-722-U-5WQ

Data in this report applies to families of products SA1C-722-U-5WQ.

### Test Information

Test Method: LM-79-2008 Report  
 Number: SP1-1908-441-10-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-722-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):                  | 2237    | CRI (Ra): | 72.0 |      |       |
| CIE u':                   | 0.2876  | R1:       | 68.9 | R9:  | -17.4 |
| CIE v':                   | 0.5346  | R2:       | 83.0 | R10: | 61.3  |
| Duv:                      | -0.0006 | R3:       | 95.2 | R11: | 59.8  |
| CIE x:                    | 0.5005  | R4:       | 66.2 | R12: | 50.5  |
| CIE y:                    | 0.4134  | R5:       | 65.9 | R13: | 71.1  |
| CIE z:                    | 0.0860  | R6:       | 76.3 | R14: | 96.9  |
| Peak Wavelength (nm):     | 603     | R7:       | 76.7 |      |       |
| Dominant Wavelength (nm): | 587     | R8:       | 43.8 |      |       |
| Purity:                   | 74.5    |           |      |      |       |
| Rf:                       | 69.8    |           |      |      |       |
| Rg:                       | 99.2    |           |      |      |       |



### Test Conditions

Stabilization Time: 71M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 24.7/41%  
 Sphere Temperature (°C): 25.6

REPORT NUMBER: SP1-1908-441-10-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 2200K 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       | 1768             | NR               | 490       | 5206             | NR               | 620       | 130919           | NR               | 750       | 8553             | NR               | 880       | 2713             | NR               |
| 365       | 1569             | NR               | 495       | 7286             | NR               | 625       | 125335           | NR               | 755       | 7696             | NR               | 885       | 2316             | NR               |
| 370       | 1594             | NR               | 500       | 10654            | NR               | 630       | 118388           | NR               | 760       | 6978             | NR               | 890       | 2539             | NR               |
| 375       | 1744             | NR               | 505       | 15189            | NR               | 635       | 111855           | NR               | 765       | 6377             | NR               | 895       | 1933             | NR               |
| 380       | 1659             | NR               | 510       | 20541            | NR               | 640       | 104062           | NR               | 770       | 5600             | NR               | 900       | 2216             | NR               |
| 385       | 1504             | NR               | 515       | 26492            | NR               | 645       | 96365            | NR               | 775       | 5000             | NR               | 905       | 2067             | NR               |
| 390       | 1541             | NR               | 520       | 32294            | NR               | 650       | 88651            | NR               | 780       | 4709             | NR               | 910       | 1959             | NR               |
| 395       | 1355             | NR               | 525       | 38123            | NR               | 655       | 81152            | NR               | 785       | 4305             | NR               | 915       | 1874             | NR               |
| 400       | 1243             | NR               | 530       | 43232            | NR               | 660       | 73523            | NR               | 790       | 4040             | NR               | 920       | 1484             | NR               |
| 405       | 1417             | NR               | 535       | 48012            | NR               | 665       | 66123            | NR               | 795       | 3642             | NR               | 925       | 1914             | NR               |
| 410       | 2147             | NR               | 540       | 52623            | NR               | 670       | 58677            | NR               | 800       | 3594             | NR               | 930       | 1948             | NR               |
| 415       | 3837             | NR               | 545       | 57516            | NR               | 675       | 52349            | NR               | 805       | 3190             | NR               | 935       | 2079             | NR               |
| 420       | 7159             | NR               | 550       | 62613            | NR               | 680       | 46159            | NR               | 810       | 3241             | NR               | 940       | 2263             | NR               |
| 425       | 12599            | NR               | 555       | 68554            | NR               | 685       | 40525            | NR               | 815       | 2732             | NR               | 945       | 1688             | NR               |
| 430       | 19019            | NR               | 560       | 75325            | NR               | 690       | 35615            | NR               | 820       | 2612             | NR               | 950       | 1560             | NR               |
| 435       | 24875            | NR               | 565       | 82533            | NR               | 695       | 31158            | NR               | 825       | 2966             | NR               | 955       | 2826             | NR               |
| 440       | 29103            | NR               | 570       | 90909            | NR               | 700       | 27409            | NR               | 830       | 2574             | NR               | 960       | 1477             | NR               |
| 445       | 29901            | NR               | 575       | 99621            | NR               | 705       | 24204            | NR               | 835       | 2633             | NR               | 965       | 1568             | NR               |
| 450       | 24862            | NR               | 580       | 108484           | NR               | 710       | 21558            | NR               | 840       | 2526             | NR               | 970       | 2030             | NR               |
| 455       | 15942            | NR               | 585       | 116679           | NR               | 715       | 19222            | NR               | 845       | 2631             | NR               | 975       | 1986             | NR               |
| 460       | 9916             | NR               | 590       | 123752           | NR               | 720       | 17310            | NR               | 850       | 2079             | NR               | 980       | 2540             | NR               |
| 465       | 7051             | NR               | 595       | 129324           | NR               | 725       | 15280            | NR               | 855       | 2309             | NR               | 985       | 1139             | NR               |
| 470       | 5227             | NR               | 600       | 134082           | NR               | 730       | 13282            | NR               | 860       | 2528             | NR               | 990       | 2018             | NR               |
| 475       | 4257             | NR               | 605       | 135698           | NR               | 735       | 11753            | NR               | 865       | 2121             | NR               | 995       | 3445             | NR               |
| 480       | 4052             | NR               | 610       | 135144           | NR               | 740       | 10654            | NR               | 870       | 2751             | NR               | 1000      | 3704             | NR               |
| 485       | 4298             | NR               | 615       | 134180           | NR               | 745       | 9451             | NR               | 875       | 2317             | NR               |           |                  |                  |

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**Scotopic Flux vs. Wavelength**



**Scotopic Lumens: 4696.9**

**S/P: 0.85**

| 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       | 1768             | NR               | 490       | 5206             | NR               | 620       | 130919           | NR               | 750       | 8553             | NR               | 880       | 2713             | NR               |
| 365       | 1569             | NR               | 495       | 7286             | NR               | 625       | 125335           | NR               | 755       | 7696             | NR               | 885       | 2316             | NR               |
| 370       | 1594             | NR               | 500       | 10654            | NR               | 630       | 118388           | NR               | 760       | 6978             | NR               | 890       | 2539             | NR               |
| 375       | 1744             | NR               | 505       | 15189            | NR               | 635       | 111855           | NR               | 765       | 6377             | NR               | 895       | 1933             | NR               |
| 380       | 1659             | NR               | 510       | 20541            | NR               | 640       | 104062           | NR               | 770       | 5600             | NR               | 900       | 2216             | NR               |
| 385       | 1504             | NR               | 515       | 26492            | NR               | 645       | 96365            | NR               | 775       | 5000             | NR               | 905       | 2067             | NR               |
| 390       | 1541             | NR               | 520       | 32294            | NR               | 650       | 88651            | NR               | 780       | 4709             | NR               | 910       | 1959             | NR               |
| 395       | 1355             | NR               | 525       | 38123            | NR               | 655       | 81152            | NR               | 785       | 4305             | NR               | 915       | 1874             | NR               |
| 400       | 1243             | NR               | 530       | 43232            | NR               | 660       | 73523            | NR               | 790       | 4040             | NR               | 920       | 1484             | NR               |
| 405       | 1417             | NR               | 535       | 48012            | NR               | 665       | 66123            | NR               | 795       | 3642             | NR               | 925       | 1914             | NR               |
| 410       | 2147             | NR               | 540       | 52623            | NR               | 670       | 58677            | NR               | 800       | 3594             | NR               | 930       | 1948             | NR               |
| 415       | 3837             | NR               | 545       | 57516            | NR               | 675       | 52349            | NR               | 805       | 3190             | NR               | 935       | 2079             | NR               |
| 420       | 7159             | NR               | 550       | 62613            | NR               | 680       | 46159            | NR               | 810       | 3241             | NR               | 940       | 2263             | NR               |
| 425       | 12599            | NR               | 555       | 68554            | NR               | 685       | 40525            | NR               | 815       | 2732             | NR               | 945       | 1688             | NR               |
| 430       | 19019            | NR               | 560       | 75325            | NR               | 690       | 35615            | NR               | 820       | 2612             | NR               | 950       | 1560             | NR               |
| 435       | 24875            | NR               | 565       | 82533            | NR               | 695       | 31158            | NR               | 825       | 2966             | NR               | 955       | 2826             | NR               |
| 440       | 29103            | NR               | 570       | 90909            | NR               | 700       | 27409            | NR               | 830       | 2574             | NR               | 960       | 1477             | NR               |
| 445       | 29901            | NR               | 575       | 99621            | NR               | 705       | 24204            | NR               | 835       | 2633             | NR               | 965       | 1568             | NR               |
| 450       | 24862            | NR               | 580       | 108484           | NR               | 710       | 21558            | NR               | 840       | 2526             | NR               | 970       | 2030             | NR               |
| 455       | 15942            | NR               | 585       | 116679           | NR               | 715       | 19222            | NR               | 845       | 2631             | NR               | 975       | 1986             | NR               |
| 460       | 9916             | NR               | 590       | 123752           | NR               | 720       | 17310            | NR               | 850       | 2079             | NR               | 980       | 2540             | NR               |
| 465       | 7051             | NR               | 595       | 129324           | NR               | 725       | 15280            | NR               | 855       | 2309             | NR               | 985       | 1139             | NR               |
| 470       | 5227             | NR               | 600       | 134082           | NR               | 730       | 13282            | NR               | 860       | 2528             | NR               | 990       | 2018             | NR               |
| 475       | 4257             | NR               | 605       | 135698           | NR               | 735       | 11753            | NR               | 865       | 2121             | NR               | 995       | 3445             | NR               |
| 480       | 4052             | NR               | 610       | 135144           | NR               | 740       | 10654            | NR               | 870       | 2751             | NR               | 1000      | 3704             | NR               |
| 485       | 4298             | NR               | 615       | 134180           | NR               | 745       | 9451             | NR               | 875       | 2317             | NR               |           |                  |                  |

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**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: 1470.8 M/P: 0.27**

| 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       | 1768             | NR               | 490       | 5206             | NR               | 620       | 130919           | NR               | 750       | 8553             | NR               | 880       | 2713             | NR               |
| 365       | 1569             | NR               | 495       | 7286             | NR               | 625       | 125335           | NR               | 755       | 7696             | NR               | 885       | 2316             | NR               |
| 370       | 1594             | NR               | 500       | 10654            | NR               | 630       | 118388           | NR               | 760       | 6978             | NR               | 890       | 2539             | NR               |
| 375       | 1744             | NR               | 505       | 15189            | NR               | 635       | 111855           | NR               | 765       | 6377             | NR               | 895       | 1933             | NR               |
| 380       | 1659             | NR               | 510       | 20541            | NR               | 640       | 104062           | NR               | 770       | 5600             | NR               | 900       | 2216             | NR               |
| 385       | 1504             | NR               | 515       | 26492            | NR               | 645       | 96365            | NR               | 775       | 5000             | NR               | 905       | 2067             | NR               |
| 390       | 1541             | NR               | 520       | 32294            | NR               | 650       | 88651            | NR               | 780       | 4709             | NR               | 910       | 1959             | NR               |
| 395       | 1355             | NR               | 525       | 38123            | NR               | 655       | 81152            | NR               | 785       | 4305             | NR               | 915       | 1874             | NR               |
| 400       | 1243             | NR               | 530       | 43232            | NR               | 660       | 73523            | NR               | 790       | 4040             | NR               | 920       | 1484             | NR               |
| 405       | 1417             | NR               | 535       | 48012            | NR               | 665       | 66123            | NR               | 795       | 3642             | NR               | 925       | 1914             | NR               |
| 410       | 2147             | NR               | 540       | 52623            | NR               | 670       | 58677            | NR               | 800       | 3594             | NR               | 930       | 1948             | NR               |
| 415       | 3837             | NR               | 545       | 57516            | NR               | 675       | 52349            | NR               | 805       | 3190             | NR               | 935       | 2079             | NR               |
| 420       | 7159             | NR               | 550       | 62613            | NR               | 680       | 46159            | NR               | 810       | 3241             | NR               | 940       | 2263             | NR               |
| 425       | 12599            | NR               | 555       | 68554            | NR               | 685       | 40525            | NR               | 815       | 2732             | NR               | 945       | 1688             | NR               |
| 430       | 19019            | NR               | 560       | 75325            | NR               | 690       | 35615            | NR               | 820       | 2612             | NR               | 950       | 1560             | NR               |
| 435       | 24875            | NR               | 565       | 82533            | NR               | 695       | 31158            | NR               | 825       | 2966             | NR               | 955       | 2826             | NR               |
| 440       | 29103            | NR               | 570       | 90909            | NR               | 700       | 27409            | NR               | 830       | 2574             | NR               | 960       | 1477             | NR               |
| 445       | 29901            | NR               | 575       | 99621            | NR               | 705       | 24204            | NR               | 835       | 2633             | NR               | 965       | 1568             | NR               |
| 450       | 24862            | NR               | 580       | 108484           | NR               | 710       | 21558            | NR               | 840       | 2526             | NR               | 970       | 2030             | NR               |
| 455       | 15942            | NR               | 585       | 116679           | NR               | 715       | 19222            | NR               | 845       | 2631             | NR               | 975       | 1986             | NR               |
| 460       | 9916             | NR               | 590       | 123752           | NR               | 720       | 17310            | NR               | 850       | 2079             | NR               | 980       | 2540             | NR               |
| 465       | 7051             | NR               | 595       | 129324           | NR               | 725       | 15280            | NR               | 855       | 2309             | NR               | 985       | 1139             | NR               |
| 470       | 5227             | NR               | 600       | 134082           | NR               | 730       | 13282            | NR               | 860       | 2528             | NR               | 990       | 2018             | NR               |
| 475       | 4257             | NR               | 605       | 135698           | NR               | 735       | 11753            | NR               | 865       | 2121             | NR               | 995       | 3445             | NR               |
| 480       | 4052             | NR               | 610       | 135144           | NR               | 740       | 10654            | NR               | 870       | 2751             | NR               | 1000      | 3704             | NR               |
| 485       | 4298             | NR               | 615       | 134180           | NR               | 745       | 9451             | NR               | 875       | 2317             | NR               |           |                  |                  |

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### Summary

$R_f = 69.8$   
 $R_g = 99.2$   
 CIE  $R_a = 72.0$   
 $R_g = -17.4$



### Color Vector Graphics



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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 87 | CES26 = 56 | CES51 = 74 | CES76 = 56 |
| CES02 = 65 | CES27 = 76 | CES52 = 76 | CES77 = 81 |
| CES03 = 32 | CES28 = 83 | CES53 = 65 | CES78 = 63 |
| CES04 = 72 | CES29 = 46 | CES54 = 78 | CES79 = 84 |
| CES05 = 52 | CES30 = 48 | CES55 = 75 | CES80 = 84 |
| CES06 = 52 | CES31 = 51 | CES56 = 65 | CES81 = 63 |
| CES07 = 44 | CES32 = 51 | CES57 = 62 | CES82 = 92 |
| CES08 = 42 | CES33 = 53 | CES58 = 66 | CES83 = 83 |
| CES09 = 29 | CES34 = 70 | CES59 = 84 | CES84 = 92 |
| CES10 = 78 | CES35 = 85 | CES60 = 90 | CES85 = 81 |
| CES11 = 61 | CES36 = 78 | CES61 = 84 | CES86 = 56 |
| CES12 = 68 | CES37 = 80 | CES62 = 70 | CES87 = 78 |
| CES13 = 45 | CES38 = 53 | CES63 = 68 | CES88 = 72 |
| CES14 = 75 | CES39 = 90 | CES64 = 69 | CES89 = 62 |
| CES15 = 72 | CES40 = 84 | CES65 = 67 | CES90 = 67 |
| CES16 = 49 | CES41 = 75 | CES66 = 64 | CES91 = 90 |
| CES17 = 51 | CES42 = 79 | CES67 = 63 | CES92 = 67 |
| CES18 = 57 | CES43 = 64 | CES68 = 69 | CES93 = 79 |
| CES19 = 74 | CES44 = 98 | CES69 = 80 | CES94 = 52 |
| CES20 = 68 | CES45 = 73 | CES70 = 63 | CES95 = 76 |
| CES21 = 89 | CES46 = 67 | CES71 = 63 | CES96 = 78 |
| CES22 = 81 | CES47 = 60 | CES72 = 87 | CES97 = 77 |
| CES23 = 92 | CES48 = 48 | CES73 = 56 | CES98 = 71 |
| CES24 = 92 | CES49 = 64 | CES74 = 87 | CES99 = 65 |
| CES25 = 74 | CES50 = 74 | CES75 = 66 |            |



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Color Rendition by Hue-Angle Bin



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**Measure Comparisons**



(END OF REPORT)