

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: P321228

Luminaire Tested: **GLEON-SA4A-730-U-T2R-HSS**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P321228  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-9)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA4A-730-U-T2R-HSS  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(4) 70 CRI, 3000K, 615mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE II  
ROADWAY OPTICS WITH HOUSE SIDE SHIELD  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 13819 lumens  
Efficiency: N/A  
Efficacy: 107.1 lumens/watt  
Luminous Opening: Rectangular (W 1' x L: 1' x H: 0')  
IES Classification: Type II - Medium  
BUG Rating: B1 - U0 - G2

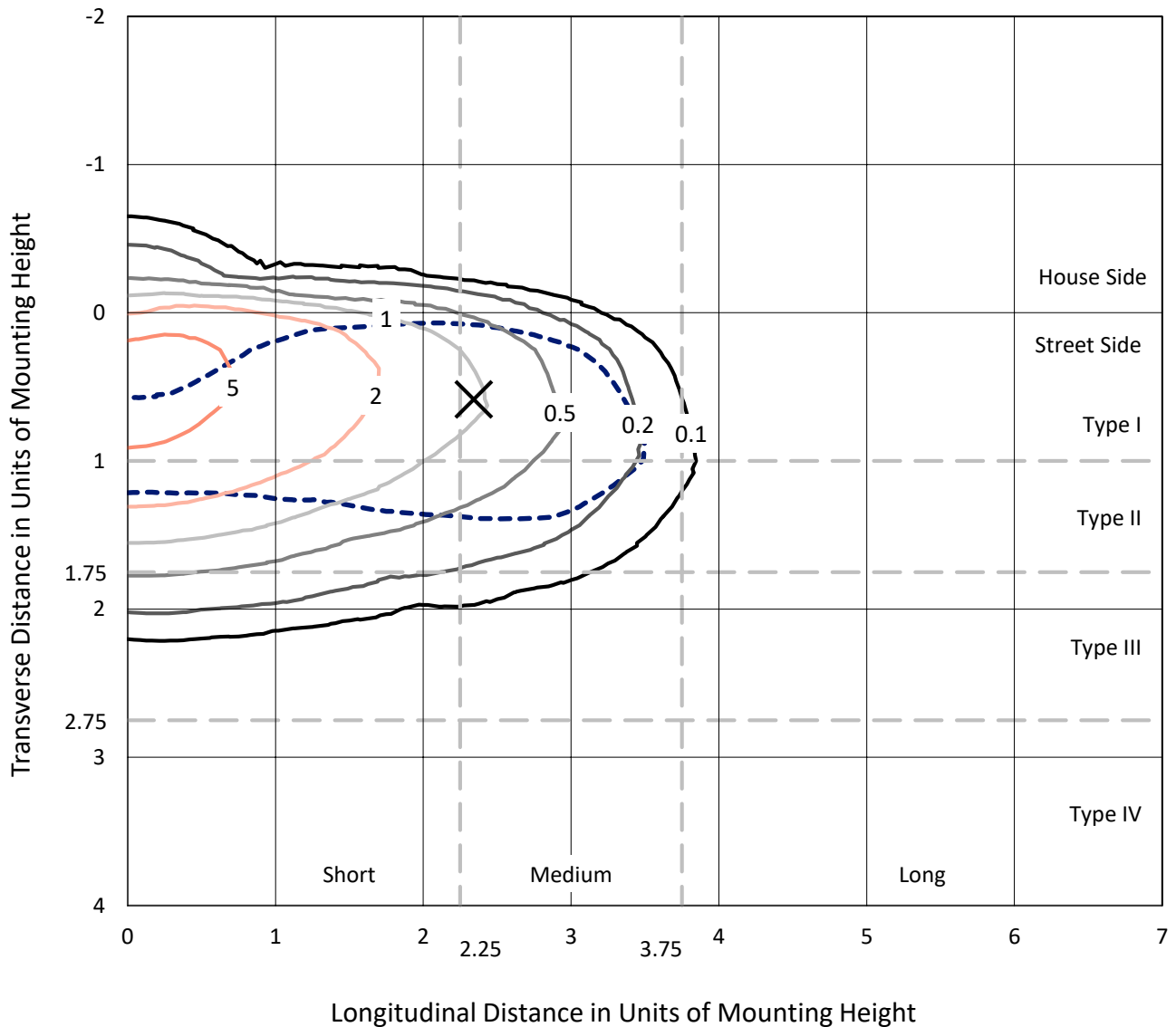
Input Watts (W): 129  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



REPORT NUMBER: P321228  
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### Iso-Footcandle Lines of Horizontal Illumination

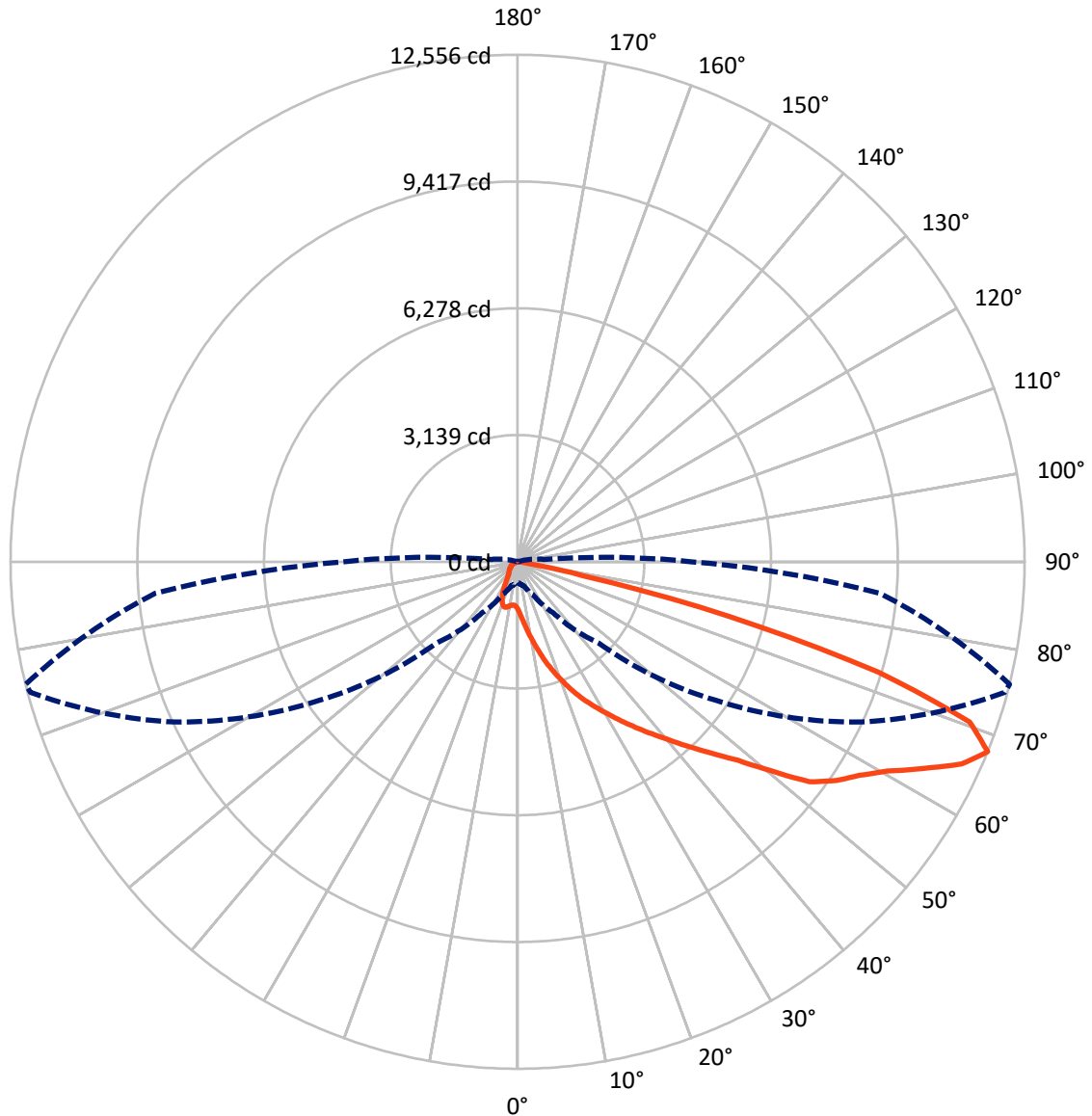
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 6.6 fc  
 Type II - Medium - N/A

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### Luminous Intensity Polar Plot



— Vertical Plane Through 76-Deg Lateral      - - - Horizontal Cone Through 67.5-Deg Vertical

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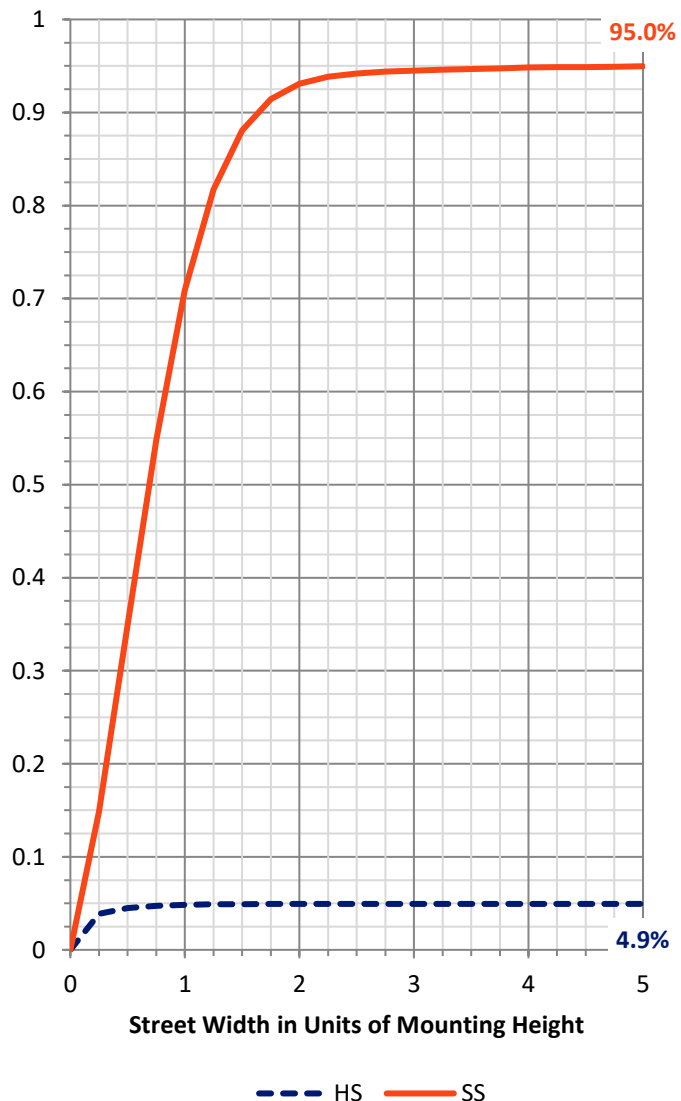
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 686.2    | 0.0    | 686.2   |
|                    | % Fixture | 5.0      | 0.0    | 5.0     |
| <b>Street Side</b> | Lumens    | 13132.8  | 0.0    | 13132.8 |
|                    | % Fixture | 95.0     | 0.0    | 95.0    |
| <b>Total</b>       | Lumens    | 13819.0  | 0.0    | 13819.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 145.8   | 1.1       |
| 10°-20°   | 577.8   | 4.2       |
| 20°-30°   | 1175.7  | 8.5       |
| 30°-40°   | 2040.7  | 14.8      |
| 40°-50°   | 2883.2  | 20.9      |
| 50°-60°   | 3269.7  | 23.7      |
| 60°-70°   | 2711.9  | 19.6      |
| 70°-80°   | 982.3   | 7.1       |
| 80°-90°   | 31.9    | 0.2       |
| 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°    | 13819.0 | 100.0     |
| 0°-180°   | 13819.0 | 100.0     |

**Coefficient of Utilization**

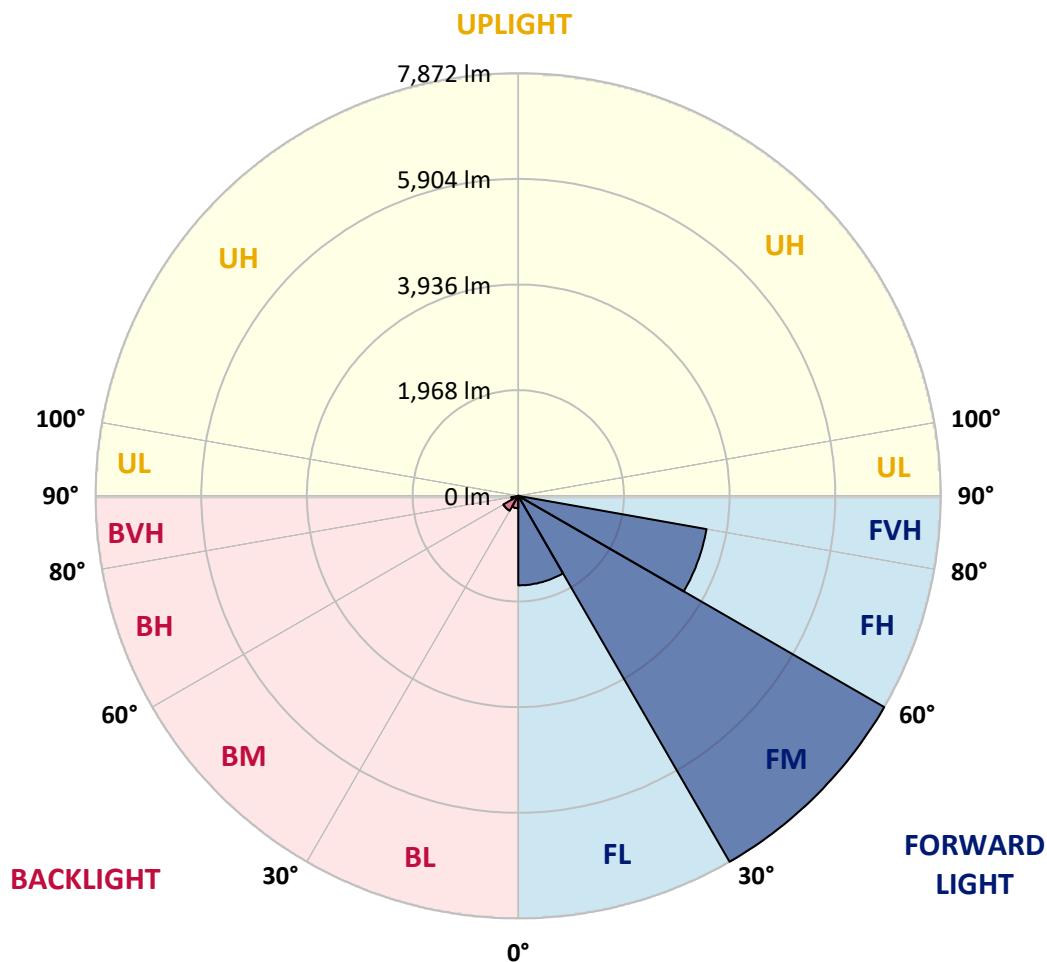


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**LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:**

| Zone           | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|----------------|--------|-----------|-------------------------|------|---------|
|                |        |           | B                       | U    | G       |
| FL (0°-30°)    | 1667.9 | 12.1      |                         |      |         |
| FM (30°-60°)   | 7872.4 | 57.0      |                         |      |         |
| FH (60°-80°)   | 3561.6 | 25.8      |                         |      | G2/5000 |
| FVH (80°-90°)  | 30.9   | 0.2       |                         |      | G1/100  |
| BL (0°-30°)    | 231.4  | 1.7       | B1/500                  |      |         |
| BM (30°-60°)   | 321.2  | 2.3       | B1/1000                 |      |         |
| BH (60°-80°)   | 132.6  | 1.0       | B1/500                  |      | G1/500  |
| BVH (80°-90°)  | 1.0    | 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-G2**  
 Type II Medium





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 65°    | 75°     | 76°     | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|---------|---------|--------|
| 0°    | 1172.3 | 1172.3 | 1172.3 | 1172.3 | 1172.3 | 1172.3 | 1172.3 | 1172.3 | 1172.3  | 1172.3  | 1172.3 |
| 2.5°  | 1749.9 | 1710.5 | 1719.6 | 1694.2 | 1648.2 | 1553.7 | 1473.2 | 1396.9 | 1307.9  | 1304.9  | 1231.6 |
| 5°    | 2359.6 | 2326.3 | 2322.1 | 2270.6 | 2187.1 | 2026.6 | 1870.4 | 1692.4 | 1493.8  | 1479.2  | 1323.6 |
| 7.5°  | 2913.1 | 2886.4 | 2876.7 | 2815.6 | 2660.0 | 2503.7 | 2300.3 | 2038.7 | 1728.1  | 1701.5  | 1447.8 |
| 10°   | 3338.1 | 3325.4 | 3327.8 | 3284.2 | 3151.0 | 3005.7 | 2738.7 | 2405.1 | 1993.9  | 1952.7  | 1596.7 |
| 12.5° | 3660.3 | 3663.3 | 3685.1 | 3658.4 | 3584.0 | 3476.2 | 3191.0 | 2795.6 | 2288.2  | 2231.9  | 1766.9 |
| 15°   | 3897.0 | 3912.1 | 3952.1 | 3985.4 | 3980.0 | 3886.7 | 3625.1 | 3192.2 | 2600.6  | 2538.3  | 1956.4 |
| 17.5° | 4050.2 | 4067.2 | 4125.3 | 4199.2 | 4267.0 | 4245.2 | 4044.1 | 3574.9 | 2916.7  | 2844.6  | 2159.2 |
| 20°   | 4184.6 | 4204.6 | 4267.0 | 4364.5 | 4491.0 | 4518.3 | 4386.3 | 3946.1 | 3232.2  | 3144.4  | 2368.7 |
| 22.5° | 4475.9 | 4475.3 | 4513.4 | 4570.3 | 4690.8 | 4761.1 | 4677.5 | 4290.6 | 3544.0  | 3452.6  | 2582.5 |
| 25°   | 5002.7 | 4982.7 | 4969.4 | 4924.5 | 4951.2 | 4994.8 | 4948.2 | 4612.7 | 3857.7  | 3765.0  | 2799.2 |
| 27.5° | 5628.7 | 5640.9 | 5533.1 | 5412.6 | 5319.3 | 5274.5 | 5198.2 | 4911.2 | 4159.2  | 4057.5  | 3011.2 |
| 30°   | 6289.3 | 6293.0 | 6165.8 | 6012.0 | 5806.8 | 5636.6 | 5504.6 | 5196.4 | 4469.2  | 4358.4  | 3217.0 |
| 32.5° | 6885.2 | 6861.5 | 6735.6 | 6526.1 | 6266.9 | 6075.6 | 5801.3 | 5514.9 | 4797.4  | 4690.2  | 3445.9 |
| 35°   | 7357.5 | 7329.6 | 7176.4 | 6985.7 | 6716.8 | 6524.3 | 6194.3 | 5832.8 | 5142.5  | 5037.8  | 3675.4 |
| 37.5° | 7702.6 | 7669.9 | 7512.5 | 7316.3 | 7084.4 | 6972.4 | 6650.2 | 6178.5 | 5519.1  | 5406.5  | 3917.0 |
| 40°   | 7822.5 | 7794.0 | 7695.3 | 7551.8 | 7365.3 | 7339.9 | 7134.0 | 6576.4 | 5929.1  | 5809.2  | 4190.7 |
| 42.5° | 7751.0 | 7723.2 | 7688.1 | 7639.6 | 7562.1 | 7586.3 | 7590.6 | 7029.9 | 6384.4  | 6266.3  | 4492.8 |
| 45°   | 7467.7 | 7442.8 | 7479.2 | 7550.0 | 7646.3 | 7766.2 | 8007.2 | 7517.3 | 6893.0  | 6767.1  | 4842.2 |
| 47.5° | 7050.5 | 7032.3 | 7132.8 | 7309.6 | 7591.2 | 7921.8 | 8388.0 | 8029.6 | 7464.0  | 7347.2  | 5278.2 |
| 50°   | 6457.1 | 6454.0 | 6655.1 | 6977.8 | 7410.7 | 7996.9 | 8781.6 | 8612.1 | 8257.2  | 8134.3  | 5884.3 |
| 52.5° | 5533.1 | 5539.1 | 5934.5 | 6451.0 | 7094.1 | 7946.0 | 9034.7 | 9360.5 | 9180.0  | 9052.3  | 6409.2 |
| 55°   | 4653.3 | 4689.6 | 4970.0 | 5714.7 | 6608.4 | 7757.1 | 9121.9 | 9709.8 | 9689.2  | 9568.1  | 6701.1 |
| 57.5° | 3791.7 | 3857.7 | 4127.7 | 4823.4 | 5899.4 | 7321.7 | 9074.0 | 9861.2 | 10068.3 | 9975.6  | 7086.2 |
| 60°   | 2858.0 | 2888.2 | 3199.5 | 3849.8 | 4989.3 | 6527.3 | 8727.1 | 9943.6 | 10586.6 | 10522.4 | 7645.1 |
| 62.5° | 1818.3 | 1894.0 | 2170.1 | 2797.4 | 3884.9 | 5424.1 | 8142.2 | 9942.3 | 11235.1 | 11270.2 | 8366.2 |
| 65°   | 957.9  | 1046.3 | 1192.8 | 1733.6 | 2669.7 | 4191.9 | 7262.4 | 9849.1 | 12030.7 | 12079.8 | 8929.9 |
| 67.5° | 516.5  | 541.9  | 619.4  | 899.8  | 1548.3 | 2839.8 | 5969.6 | 9388.9 | 12491.5 | 12556.3 | 9008.7 |
| 70°   | 377.8  | 391.8  | 420.8  | 497.7  | 779.3  | 1649.4 | 4356.0 | 8345.6 | 11897.5 | 11873.3 | 8004.1 |
| 72.5° | 290.0  | 311.8  | 333.6  | 364.5  | 448.1  | 880.4  | 2712.0 | 6535.2 | 9493.1  | 9333.2  | 5983.0 |
| 75°   | 228.9  | 232.5  | 263.4  | 291.2  | 336.1  | 501.4  | 1204.3 | 3806.2 | 5794.0  | 5415.6  | 3102.6 |
| 77.5° | 182.9  | 185.3  | 203.4  | 227.7  | 270.1  | 329.4  | 373.0  | 1497.4 | 1849.8  | 1650.6  | 673.3  |
| 80°   | 108.4  | 114.4  | 151.4  | 175.6  | 224.0  | 207.7  | 136.2  | 325.2  | 288.8   | 261.6   | 113.2  |
| 82.5° | 60.6   | 65.4   | 85.4   | 138.7  | 156.2  | 99.3   | 67.8   | 87.8   | 67.8    | 66.0    | 32.1   |
| 85°   | 0.0    | 3.0    | 55.1   | 86.0   | 63.6   | 21.8   | 28.5   | 29.1   | 20.0    | 18.8    | 12.7   |
| 87.5° | 0.0    | 0.0    | 17.0   | 16.3   | 2.4    | 3.6    | 6.7    | 9.7    | 7.9     | 7.9     | 6.7    |
| 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: P321228

CATALOG NUMBER: GLEON-SA4A-730-U-T2R-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1172.3 | 1172.3 | 1172.3 | 1172.3 | 1172.3 | 1172.3 | 1172.3 | 1172.3 | 1172.3 | 1172.3 | 1172.3 |
| 2.5°  | 1195.3 | 1162.6 | 1100.8 | 1040.3 | 989.4  | 947.6  | 910.1  | 894.9  | 882.8  | 881.0  | 871.3  |
| 5°    | 1248.5 | 1182.5 | 1064.5 | 967.6  | 902.8  | 856.8  | 817.4  | 793.2  | 774.4  | 767.2  | 760.5  |
| 7.5°  | 1329.1 | 1229.2 | 1059.6 | 948.2  | 870.7  | 793.2  | 720.5  | 641.8  | 592.8  | 574.0  | 563.1  |
| 10°   | 1427.2 | 1290.9 | 1077.8 | 942.8  | 807.1  | 643.6  | 523.2  | 423.2  | 382.7  | 369.4  | 365.7  |
| 12.5° | 1541.6 | 1367.8 | 1109.3 | 908.9  | 671.5  | 457.2  | 360.9  | 327.0  | 317.9  | 313.6  | 313.6  |
| 15°   | 1673.0 | 1452.0 | 1131.7 | 810.8  | 496.5  | 345.7  | 312.4  | 296.7  | 287.0  | 281.6  | 282.2  |
| 17.5° | 1807.4 | 1534.3 | 1120.8 | 668.5  | 366.3  | 307.6  | 282.8  | 265.8  | 252.5  | 247.0  | 245.8  |
| 20°   | 1943.1 | 1610.6 | 1060.2 | 497.7  | 310.0  | 279.1  | 251.3  | 232.5  | 219.2  | 213.7  | 212.5  |
| 22.5° | 2083.5 | 1675.4 | 953.7  | 365.1  | 278.5  | 247.7  | 220.4  | 201.6  | 188.9  | 184.1  | 181.7  |
| 25°   | 2220.4 | 1728.1 | 804.7  | 295.5  | 248.9  | 218.0  | 191.9  | 174.4  | 162.9  | 158.0  | 157.4  |
| 27.5° | 2348.1 | 1761.4 | 632.1  | 261.0  | 222.8  | 191.3  | 167.7  | 152.0  | 142.3  | 138.7  | 138.1  |
| 30°   | 2463.2 | 1764.4 | 467.4  | 235.5  | 199.8  | 168.3  | 146.5  | 132.6  | 124.1  | 120.5  | 119.3  |
| 32.5° | 2579.4 | 1739.0 | 340.3  | 212.5  | 178.6  | 148.3  | 127.2  | 116.3  | 110.2  | 107.2  | 107.2  |
| 35°   | 2689.0 | 1680.3 | 265.2  | 192.5  | 158.0  | 129.0  | 112.0  | 104.1  | 100.5  | 97.5   | 97.5   |
| 37.5° | 2796.2 | 1596.1 | 225.2  | 175.0  | 138.7  | 112.6  | 98.7   | 93.9   | 90.8   | 87.8   | 87.8   |
| 40°   | 2905.2 | 1490.1 | 204.7  | 158.6  | 122.9  | 99.9   | 87.8   | 83.6   | 80.5   | 78.1   | 77.5   |
| 42.5° | 3039.0 | 1367.8 | 191.3  | 143.5  | 109.0  | 88.4   | 77.5   | 72.7   | 70.2   | 67.8   | 66.6   |
| 45°   | 3194.0 | 1262.5 | 180.4  | 128.4  | 97.5   | 78.7   | 67.2   | 62.4   | 58.7   | 55.7   | 55.1   |
| 47.5° | 3417.5 | 1186.2 | 165.9  | 112.0  | 86.6   | 68.4   | 58.1   | 52.7   | 47.2   | 44.2   | 43.6   |
| 50°   | 3702.6 | 1123.2 | 147.1  | 97.5   | 75.7   | 58.1   | 48.4   | 41.8   | 36.9   | 33.9   | 33.9   |
| 52.5° | 3844.3 | 1040.9 | 130.2  | 84.8   | 63.6   | 49.0   | 39.4   | 31.5   | 29.1   | 26.0   | 26.0   |
| 55°   | 3901.2 | 977.9  | 113.2  | 72.1   | 52.7   | 40.6   | 30.9   | 24.2   | 22.4   | 20.6   | 20.0   |
| 57.5° | 4061.1 | 959.7  | 98.7   | 61.2   | 43.6   | 32.1   | 23.6   | 18.2   | 17.0   | 14.5   | 14.5   |
| 60°   | 4318.4 | 968.8  | 85.4   | 52.1   | 35.1   | 24.8   | 17.6   | 13.9   | 12.7   | 10.3   | 10.3   |
| 62.5° | 4596.4 | 957.3  | 72.1   | 44.8   | 27.2   | 18.2   | 12.1   | 10.3   | 10.3   | 6.1    | 5.4    |
| 65°   | 4649.6 | 852.5  | 61.8   | 36.9   | 21.2   | 13.3   | 7.9    | 6.7    | 9.1    | 1.2    | 0.0    |
| 67.5° | 4315.4 | 661.2  | 53.3   | 28.5   | 15.7   | 10.3   | 6.1    | 3.0    | 7.9    | 0.0    | 0.0    |
| 70°   | 3450.8 | 420.2  | 43.0   | 20.6   | 12.1   | 8.5    | 4.8    | 1.2    | 6.1    | 0.0    | 0.0    |
| 72.5° | 2440.2 | 244.0  | 33.9   | 14.5   | 10.3   | 6.7    | 3.6    | 0.0    | 3.6    | 0.0    | 0.0    |
| 75°   | 1234.0 | 130.2  | 21.2   | 10.9   | 7.9    | 4.8    | 2.4    | 0.0    | 0.6    | 0.0    | 0.0    |
| 77.5° | 267.0  | 60.6   | 13.3   | 7.9    | 5.4    | 3.0    | 1.2    | 0.0    | 0.0    | 0.0    | 0.0    |
| 80°   | 58.1   | 26.6   | 8.5    | 4.8    | 3.0    | 1.8    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 82.5° | 21.2   | 13.9   | 4.2    | 2.4    | 1.2    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 85°   | 11.5   | 7.3    | 2.4    | 1.2    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 87.5° | 6.1    | 2.4    | 0.6    | 0.6    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |



Signify Classified - Internal  
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1121 Highway 74 South  
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LM-79-2008: Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Report Prepared for

Cooper Lighting Solutions

McGRAW-EDISON

Report Number: SP1-1908-441-2-R4

Test Date: 10/03/2019

Luminaire Tested: SA1C-730-U-5WQ

Data in this report applies to families of products SA1C-730-U-5WQ .

**Test Information**

Test Method: LM-79-2008  
 Report Number: SP1-1908-441-2-R4  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry: 4π  
 Issue Date: 10/28/2024  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: MCGRAW-EDISON  
 Catalog Number: **SA1C-730-U-5WQ**  
 Description: MCGRAW EDISON ROADWAY AND AREA LUMINAIRE

\*\*\*THIS IS A REVISION OF SP1-1908-441-2-R3. TO UPDATE THE CATALOG INFORMATION.\*\*\*TESTED IN SITU. (1) 70 CRI, 3000K, 1050MA LIGHTSQUARE WITH 16 LEDS AND TYPE V WIDE OPTICS.

**Spectral Parameters**

|                           |        |           |      |      |       |
|---------------------------|--------|-----------|------|------|-------|
| CCT (K):                  | 2993   | CRI (Ra): | 71.8 | R9:  | -38.3 |
| CIE u':                   | 0.2508 | R1:       | 67.5 | R10: | 62.5  |
| CIE v':                   | 0.5215 | R2:       | 82.9 | R11: | 63.7  |
| Duv:                      | 0.0000 | R3:       | 94.7 | R12: | 57.8  |
| CIE x:                    | 0.4374 | R4:       | 67.7 | R13: | 70.4  |
| CIE y:                    | 0.4043 | R5:       | 67.9 | R14: | 97.3  |
| CIE z:                    | 0.1583 | R6:       | 77.6 |      |       |
| Peak Wavelength (nm):     | 593    | R7:       | 76.0 |      |       |
| Dominant Wavelength (nm): | 582    | R8:       | 40.5 |      |       |
| Purity:                   | 53     |           |      |      |       |
| Rf:                       | 75.7   |           |      |      |       |
| Rg:                       | 93.9   |           |      |      |       |



**Test Conditions**

Stabilization Time: 53M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 25.0./44%  
 Sphere Temperature (°C): 25.7

REPORT NUMBER: SP1-1908-441-2-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 3000K 4-step quadrangle

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**Photopic Flux vs. Wavelength**



#####

| λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) |
|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|
| 360    | 2397          | NR            | 490    | 24908         | NR            | 620    | 118784        | NR            | 750    | 5037          | NR            | 880    | 2677          | NR            |
| 365    | 2084          | NR            | 495    | 30998         | NR            | 625    | 108951        | NR            | 755    | 4413          | NR            | 885    | 2940          | NR            |
| 370    | 2143          | NR            | 500    | 37103         | NR            | 630    | 99573         | NR            | 760    | 4189          | NR            | 890    | 3116          | NR            |
| 375    | 2413          | NR            | 505    | 42987         | NR            | 635    | 90444         | NR            | 765    | 3677          | NR            | 895    | 3345          | NR            |
| 380    | 2172          | NR            | 510    | 48702         | NR            | 640    | 80749         | NR            | 770    | 3366          | NR            | 900    | 2312          | NR            |
| 385    | 1997          | NR            | 515    | 53741         | NR            | 645    | 71664         | NR            | 775    | 3211          | NR            | 905    | 2829          | NR            |
| 390    | 1830          | NR            | 520    | 57283         | NR            | 650    | 63936         | NR            | 780    | 2682          | NR            | 910    | 2783          | NR            |
| 395    | 1861          | NR            | 525    | 61876         | NR            | 655    | 56611         | NR            | 785    | 2804          | NR            | 915    | 2662          | NR            |
| 400    | 1717          | NR            | 530    | 65398         | NR            | 660    | 49763         | NR            | 790    | 2581          | NR            | 920    | 3047          | NR            |
| 405    | 1761          | NR            | 535    | 69597         | NR            | 665    | 42891         | NR            | 795    | 2711          | NR            | 925    | 2256          | NR            |
| 410    | 2680          | NR            | 540    | 74214         | NR            | 670    | 36939         | NR            | 800    | 2609          | NR            | 930    | 2976          | NR            |
| 415    | 4374          | NR            | 545    | 79911         | NR            | 675    | 31946         | NR            | 805    | 2581          | NR            | 935    | 3503          | NR            |
| 420    | 8071          | NR            | 550    | 86153         | NR            | 680    | 27385         | NR            | 810    | 2404          | NR            | 940    | 4226          | NR            |
| 425    | 15169         | NR            | 555    | 93952         | NR            | 685    | 23504         | NR            | 815    | 2556          | NR            | 945    | 2930          | NR            |
| 430    | 26038         | NR            | 560    | 102904        | NR            | 690    | 20210         | NR            | 820    | 2742          | NR            | 950    | 2115          | NR            |
| 435    | 41316         | NR            | 565    | 112009        | NR            | 695    | 17459         | NR            | 825    | 2014          | NR            | 955    | 2634          | NR            |
| 440    | 59674         | NR            | 570    | 121662        | NR            | 700    | 15207         | NR            | 830    | 2488          | NR            | 960    | 4200          | NR            |
| 445    | 72751         | NR            | 575    | 130476        | NR            | 705    | 13322         | NR            | 835    | 2625          | NR            | 965    | 1982          | NR            |
| 450    | 65091         | NR            | 580    | 137926        | NR            | 710    | 11676         | NR            | 840    | 2754          | NR            | 970    | 3613          | NR            |
| 455    | 44894         | NR            | 585    | 143406        | NR            | 715    | 10626         | NR            | 845    | 2708          | NR            | 975    | 4034          | NR            |
| 460    | 32712         | NR            | 590    | 147039        | NR            | 720    | 9416          | NR            | 850    | 2608          | NR            | 980    | 3922          | NR            |
| 465    | 25296         | NR            | 595    | 147365        | NR            | 725    | 8333          | NR            | 855    | 2605          | NR            | 985    | 1909          | NR            |
| 470    | 19318         | NR            | 600    | 145800        | NR            | 730    | 7134          | NR            | 860    | 1765          | NR            | 990    | 3617          | NR            |
| 475    | 17265         | NR            | 605    | 141363        | NR            | 735    | 6437          | NR            | 865    | 2581          | NR            | 995    | 4767          | NR            |
| 480    | 18260         | NR            | 610    | 134199        | NR            | 740    | 5834          | NR            | 870    | 3016          | NR            | 1000   | 2528          | NR            |
| 485    | 20845         | NR            | 615    | 127683        | NR            | 745    | 5500          | NR            | 875    | 3952          | NR            |        |               |               |

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Scotopic Flux vs. Wavelength



Scotopic Lumens: 8494.8

S/P: 1.23

| λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) |
|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|
| 360    | 2397          | NR            | 490    | 24908         | NR            | 620    | 118784        | NR            | 750    | 5037          | NR            | 880    | 2677          | NR            |
| 365    | 2084          | NR            | 495    | 30998         | NR            | 625    | 108951        | NR            | 755    | 4413          | NR            | 885    | 2940          | NR            |
| 370    | 2143          | NR            | 500    | 37103         | NR            | 630    | 99573         | NR            | 760    | 4189          | NR            | 890    | 3116          | NR            |
| 375    | 2413          | NR            | 505    | 42987         | NR            | 635    | 90444         | NR            | 765    | 3677          | NR            | 895    | 3345          | NR            |
| 380    | 2172          | NR            | 510    | 48702         | NR            | 640    | 80749         | NR            | 770    | 3366          | NR            | 900    | 2312          | NR            |
| 385    | 1997          | NR            | 515    | 53741         | NR            | 645    | 71664         | NR            | 775    | 3211          | NR            | 905    | 2829          | NR            |
| 390    | 1830          | NR            | 520    | 57283         | NR            | 650    | 63936         | NR            | 780    | 2682          | NR            | 910    | 2783          | NR            |
| 395    | 1861          | NR            | 525    | 61876         | NR            | 655    | 56611         | NR            | 785    | 2804          | NR            | 915    | 2662          | NR            |
| 400    | 1717          | NR            | 530    | 65398         | NR            | 660    | 49763         | NR            | 790    | 2581          | NR            | 920    | 3047          | NR            |
| 405    | 1761          | NR            | 535    | 69597         | NR            | 665    | 42891         | NR            | 795    | 2711          | NR            | 925    | 2256          | NR            |
| 410    | 2680          | NR            | 540    | 74214         | NR            | 670    | 36939         | NR            | 800    | 2609          | NR            | 930    | 2976          | NR            |
| 415    | 4374          | NR            | 545    | 79911         | NR            | 675    | 31946         | NR            | 805    | 2581          | NR            | 935    | 3503          | NR            |
| 420    | 8071          | NR            | 550    | 86153         | NR            | 680    | 27385         | NR            | 810    | 2404          | NR            | 940    | 4226          | NR            |
| 425    | 15169         | NR            | 555    | 93952         | NR            | 685    | 23504         | NR            | 815    | 2556          | NR            | 945    | 2930          | NR            |
| 430    | 26038         | NR            | 560    | 102904        | NR            | 690    | 20210         | NR            | 820    | 2742          | NR            | 950    | 2115          | NR            |
| 435    | 41316         | NR            | 565    | 112009        | NR            | 695    | 17459         | NR            | 825    | 2014          | NR            | 955    | 2634          | NR            |
| 440    | 59674         | NR            | 570    | 121662        | NR            | 700    | 15207         | NR            | 830    | 2488          | NR            | 960    | 4200          | NR            |
| 445    | 72751         | NR            | 575    | 130476        | NR            | 705    | 13322         | NR            | 835    | 2625          | NR            | 965    | 1982          | NR            |
| 450    | 65091         | NR            | 580    | 137926        | NR            | 710    | 11676         | NR            | 840    | 2754          | NR            | 970    | 3613          | NR            |
| 455    | 44894         | NR            | 585    | 143406        | NR            | 715    | 10626         | NR            | 845    | 2708          | NR            | 975    | 4034          | NR            |
| 460    | 32712         | NR            | 590    | 147039        | NR            | 720    | 9416          | NR            | 850    | 2608          | NR            | 980    | 3922          | NR            |
| 465    | 25296         | NR            | 595    | 147365        | NR            | 725    | 8333          | NR            | 855    | 2605          | NR            | 985    | 1909          | NR            |
| 470    | 19318         | NR            | 600    | 145800        | NR            | 730    | 7134          | NR            | 860    | 1765          | NR            | 990    | 3617          | NR            |
| 475    | 17265         | NR            | 605    | 141363        | NR            | 735    | 6437          | NR            | 865    | 2581          | NR            | 995    | 4767          | NR            |
| 480    | 18260         | NR            | 610    | 134199        | NR            | 740    | 5834          | NR            | 870    | 3016          | NR            | 1000   | 2528          | NR            |
| 485    | 20845         | NR            | 615    | 127683        | NR            | 745    | 5500          | NR            | 875    | 3952          | NR            |        |               |               |

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**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: 3101.5 M/P: 0.45**

| λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) |
|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|
| 360    | 2397          | NR            | 490    | 24908         | NR            | 620    | 118784        | NR            | 750    | 5037          | NR            | 880    | 2677          | NR            |
| 365    | 2084          | NR            | 495    | 30998         | NR            | 625    | 108951        | NR            | 755    | 4413          | NR            | 885    | 2940          | NR            |
| 370    | 2143          | NR            | 500    | 37103         | NR            | 630    | 99573         | NR            | 760    | 4189          | NR            | 890    | 3116          | NR            |
| 375    | 2413          | NR            | 505    | 42987         | NR            | 635    | 90444         | NR            | 765    | 3677          | NR            | 895    | 3345          | NR            |
| 380    | 2172          | NR            | 510    | 48702         | NR            | 640    | 80749         | NR            | 770    | 3366          | NR            | 900    | 2312          | NR            |
| 385    | 1997          | NR            | 515    | 53741         | NR            | 645    | 71664         | NR            | 775    | 3211          | NR            | 905    | 2829          | NR            |
| 390    | 1830          | NR            | 520    | 57283         | NR            | 650    | 63936         | NR            | 780    | 2682          | NR            | 910    | 2783          | NR            |
| 395    | 1861          | NR            | 525    | 61876         | NR            | 655    | 56611         | NR            | 785    | 2804          | NR            | 915    | 2662          | NR            |
| 400    | 1717          | NR            | 530    | 65398         | NR            | 660    | 49763         | NR            | 790    | 2581          | NR            | 920    | 3047          | NR            |
| 405    | 1761          | NR            | 535    | 69597         | NR            | 665    | 42891         | NR            | 795    | 2711          | NR            | 925    | 2256          | NR            |
| 410    | 2680          | NR            | 540    | 74214         | NR            | 670    | 36939         | NR            | 800    | 2609          | NR            | 930    | 2976          | NR            |
| 415    | 4374          | NR            | 545    | 79911         | NR            | 675    | 31946         | NR            | 805    | 2581          | NR            | 935    | 3503          | NR            |
| 420    | 8071          | NR            | 550    | 86153         | NR            | 680    | 27385         | NR            | 810    | 2404          | NR            | 940    | 4226          | NR            |
| 425    | 15169         | NR            | 555    | 93952         | NR            | 685    | 23504         | NR            | 815    | 2556          | NR            | 945    | 2930          | NR            |
| 430    | 26038         | NR            | 560    | 102904        | NR            | 690    | 20210         | NR            | 820    | 2742          | NR            | 950    | 2115          | NR            |
| 435    | 41316         | NR            | 565    | 112009        | NR            | 695    | 17459         | NR            | 825    | 2014          | NR            | 955    | 2634          | NR            |
| 440    | 59674         | NR            | 570    | 121662        | NR            | 700    | 15207         | NR            | 830    | 2488          | NR            | 960    | 4200          | NR            |
| 445    | 72751         | NR            | 575    | 130476        | NR            | 705    | 13322         | NR            | 835    | 2625          | NR            | 965    | 1982          | NR            |
| 450    | 65091         | NR            | 580    | 137926        | NR            | 710    | 11676         | NR            | 840    | 2754          | NR            | 970    | 3613          | NR            |
| 455    | 44894         | NR            | 585    | 143406        | NR            | 715    | 10626         | NR            | 845    | 2708          | NR            | 975    | 4034          | NR            |
| 460    | 32712         | NR            | 590    | 147039        | NR            | 720    | 9416          | NR            | 850    | 2608          | NR            | 980    | 3922          | NR            |
| 465    | 25296         | NR            | 595    | 147365        | NR            | 725    | 8333          | NR            | 855    | 2605          | NR            | 985    | 1909          | NR            |
| 470    | 19318         | NR            | 600    | 145800        | NR            | 730    | 7134          | NR            | 860    | 1765          | NR            | 990    | 3617          | NR            |
| 475    | 17265         | NR            | 605    | 141363        | NR            | 735    | 6437          | NR            | 865    | 2581          | NR            | 995    | 4767          | NR            |
| 480    | 18260         | NR            | 610    | 134199        | NR            | 740    | 5834          | NR            | 870    | 3016          | NR            | 1000   | 2528          | NR            |
| 485    | 20845         | NR            | 615    | 127683        | NR            | 745    | 5500          | NR            | 875    | 3952          | NR            |        |               |               |

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**Summary**

$R_f = 75.7$   
 $R_g = 93.9$   
 CIE  $R_a = 71.8$   
 $R_9 = -38.3$



**Color Vector Graphics**





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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 67 | CES51 = 87 | CES76 = 63 |
| CES02 = 63 | CES27 = 88 | CES52 = 86 | CES77 = 80 |
| CES03 = 31 | CES28 = 87 | CES53 = 78 | CES78 = 67 |
| CES04 = 71 | CES29 = 66 | CES54 = 84 | CES79 = 87 |
| CES05 = 49 | CES30 = 73 | CES55 = 84 | CES80 = 86 |
| CES06 = 51 | CES31 = 70 | CES56 = 75 | CES81 = 71 |
| CES07 = 41 | CES32 = 65 | CES57 = 74 | CES82 = 94 |
| CES08 = 40 | CES33 = 73 | CES58 = 76 | CES83 = 90 |
| CES09 = 29 | CES34 = 79 | CES59 = 85 | CES84 = 89 |
| CES10 = 76 | CES35 = 89 | CES60 = 93 | CES85 = 77 |
| CES11 = 59 | CES36 = 97 | CES61 = 84 | CES86 = 61 |
| CES12 = 65 | CES37 = 87 | CES62 = 91 | CES87 = 78 |
| CES13 = 43 | CES38 = 81 | CES63 = 77 | CES88 = 77 |
| CES14 = 74 | CES39 = 95 | CES64 = 72 | CES89 = 67 |
| CES15 = 71 | CES40 = 92 | CES65 = 68 | CES90 = 76 |
| CES16 = 47 | CES41 = 88 | CES66 = 69 | CES91 = 89 |
| CES17 = 50 | CES42 = 89 | CES67 = 67 | CES92 = 58 |
| CES18 = 56 | CES43 = 79 | CES68 = 72 | CES93 = 74 |
| CES19 = 73 | CES44 = 99 | CES69 = 81 | CES94 = 49 |
| CES20 = 66 | CES45 = 85 | CES70 = 66 | CES95 = 68 |
| CES21 = 87 | CES46 = 80 | CES71 = 67 | CES96 = 76 |
| CES22 = 79 | CES47 = 82 | CES72 = 88 | CES97 = 82 |
| CES23 = 92 | CES48 = 69 | CES73 = 59 | CES98 = 75 |
| CES24 = 91 | CES49 = 80 | CES74 = 95 | CES99 = 62 |
| CES25 = 73 | CES50 = 87 | CES75 = 69 |            |



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Color Rendition by Hue-Angle Bin



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Measure Comparisons



(END OF REPORT)