

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: P318031

Luminaire Tested: **GLEON-SA7A-730-U-T2**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P318031  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-12)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA7A-730-U-T2  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(7) 70 CRI, 3000K, 615mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE II OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 29458 lumens  
Efficiency: N/A  
Efficacy: 130.3 lumens/watt  
Luminous Opening: Rectangular (W 2' x L: 1' x H: 0')  
IES Classification: Type III - Medium  
BUG Rating: B3 - U0 - G4

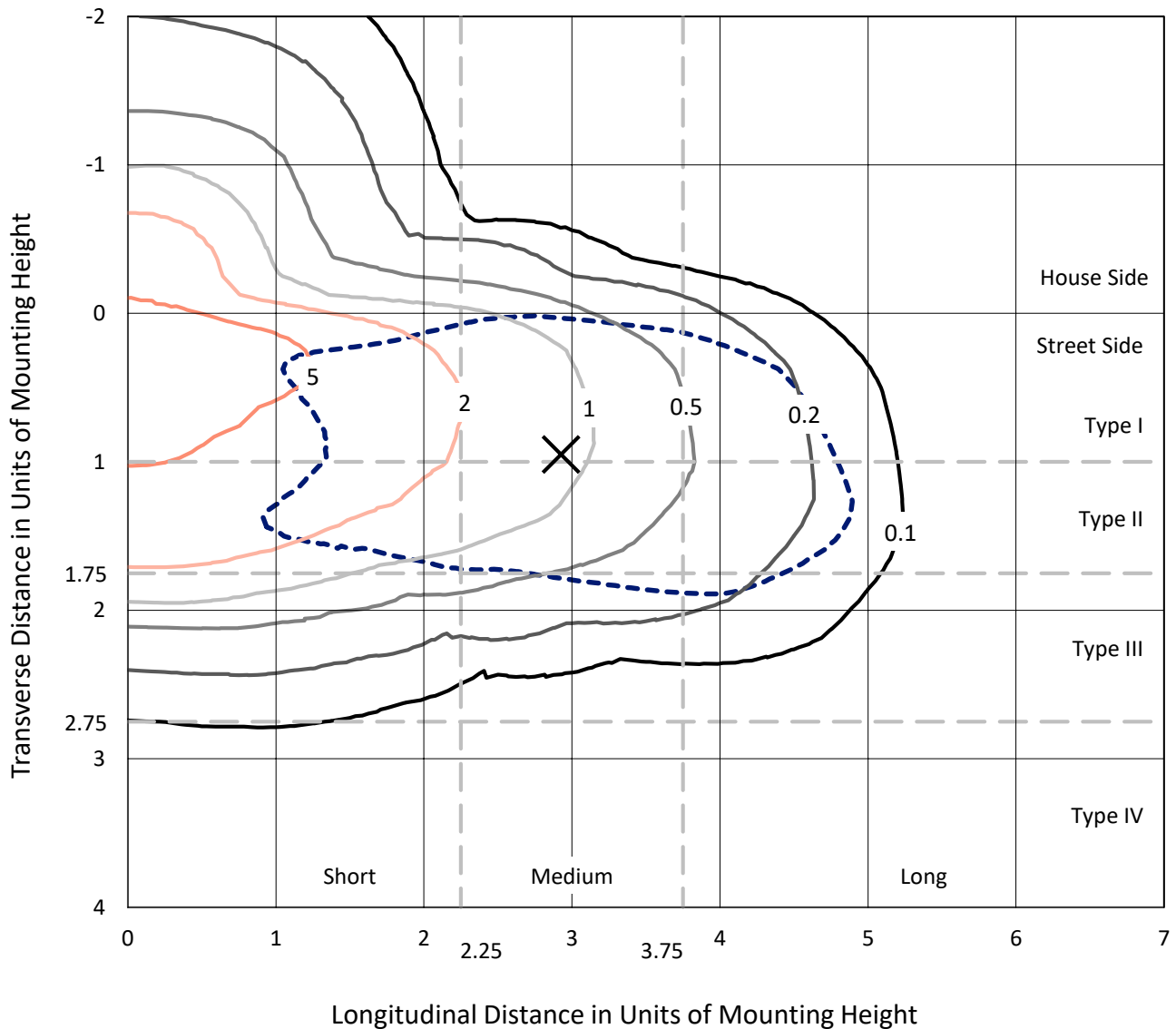
Input Watts (W): 226  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



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## Iso-Footcandle Lines of Horizontal Illumination

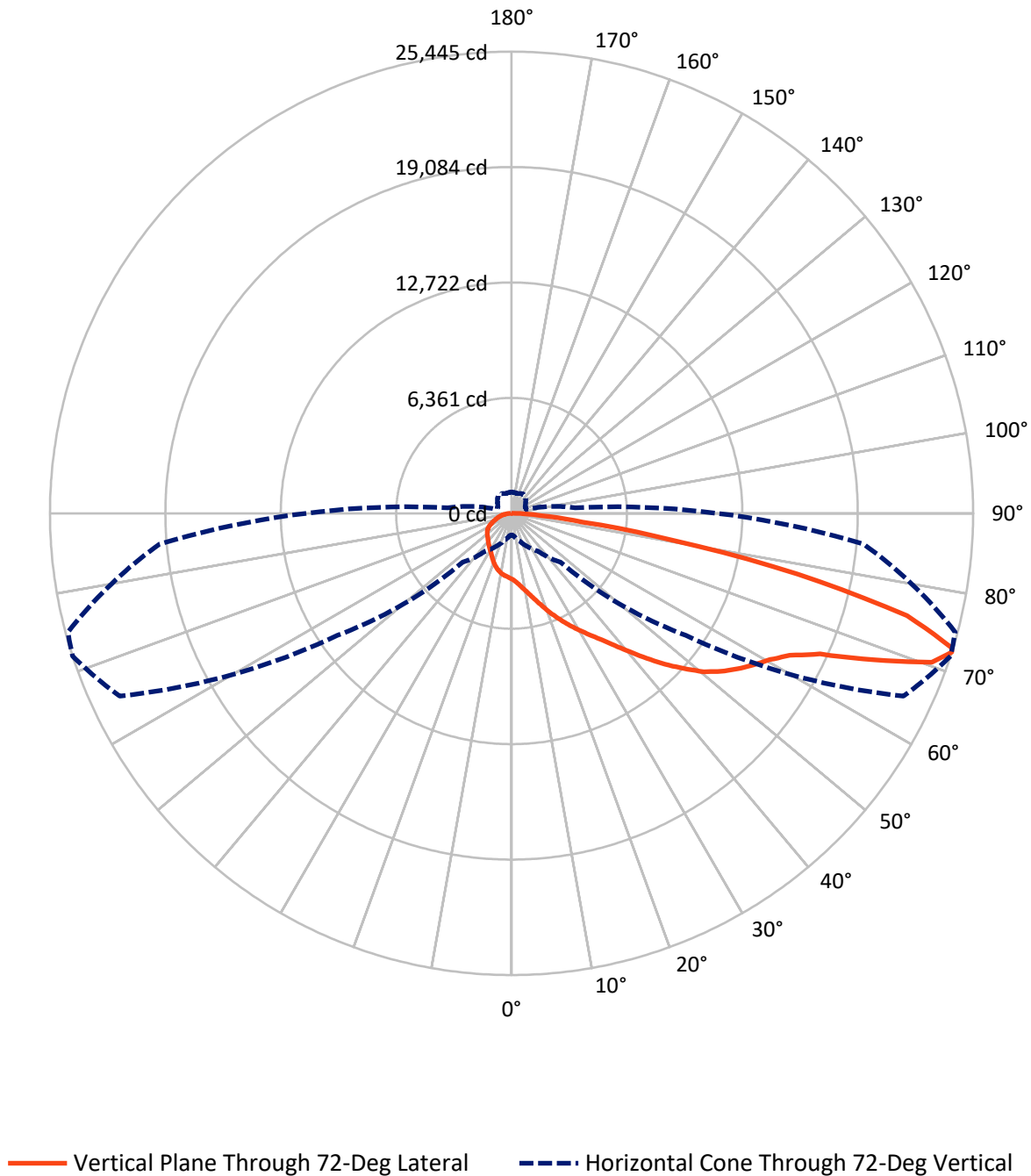
× Max cd  
- - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 8 fc  
Type III - Medium - N/A

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## Luminous Intensity Polar Plot



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**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 5464.7   | 0.0    | 5464.7  |
|                    | % Fixture | 18.6     | 0.0    | 18.6    |
| <b>Street Side</b> | Lumens    | 23993.4  | 0.0    | 23993.4 |
|                    | % Fixture | 81.4     | 0.0    | 81.4    |
| <b>Total</b>       | Lumens    | 29458.0  | 0.0    | 29458.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 363.1   | 1.2       |
| 10°-20°   | 1173.5  | 4.0       |
| 20°-30°   | 2056.4  | 7.0       |
| 30°-40°   | 3048.9  | 10.4      |
| 40°-50°   | 4459.3  | 15.1      |
| 50°-60°   | 6136.0  | 20.8      |
| 60°-70°   | 6831.2  | 23.2      |
| 70°-80°   | 4628.8  | 15.7      |
| 80°-90°   | 760.8   | 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°    | 29458.0 | 100.0     |
| 0°-180°   | 29458.0 | 100.0     |

**Coefficient of Utilization**



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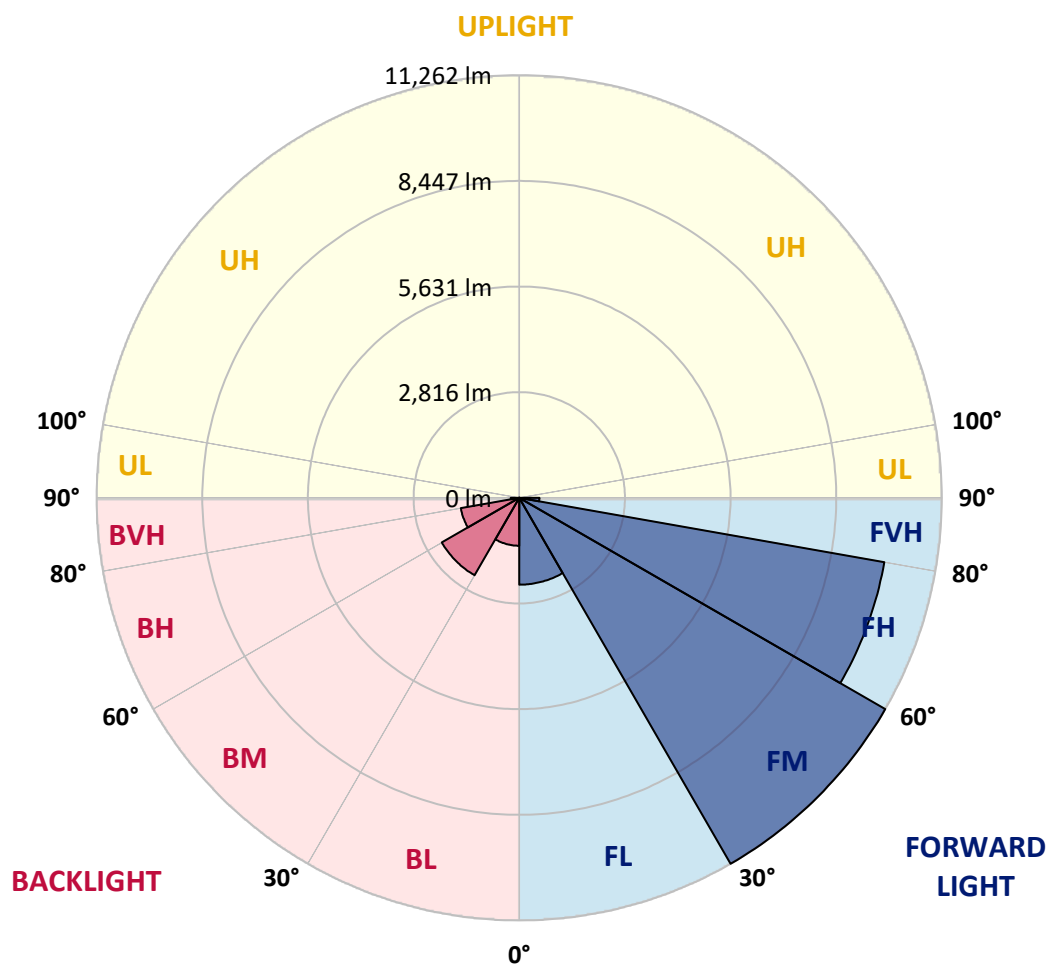
CATALOG NUMBER: GLEON-SA7A-730-U-T2

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

| Zone |             | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |          |
|------|-------------|---------|-----------|-------------------------|------|----------|
|      |             |         |           | B                       | U    | G        |
| FL   | (0°-30°)    | 2315.6  | 7.9       |                         |      |          |
| FM   | (30°-60°)   | 11262.2 | 38.2      |                         |      |          |
| FH   | (60°-80°)   | 9879.0  | 33.5      |                         |      | G4/12000 |
| FVH  | (80°-90°)   | 536.6   | 1.8       |                         |      | G4/750   |
| BL   | (0°-30°)    | 1277.4  | 4.3       | B3/2500                 |      |          |
| BM   | (30°-60°)   | 2382.1  | 8.1       | B2/2500                 |      |          |
| BH   | (60°-80°)   | 1581.0  | 5.4       | B3/2500                 |      | G3/2500  |
| BVH  | (80°-90°)   | 224.1   | 0.8       |                         |      | 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 III Medium



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 45°     | 55°     | 65°     | 72°     | 75°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 3624.1  | 3624.1  | 3624.1  | 3624.1  | 3624.1  | 3624.1  | 3624.1  | 3624.1  | 3624.1  | 3624.1  | 3624.1  |
| 2.5°  | 4003.5  | 3997.4  | 3976.1  | 3976.1  | 3935.5  | 3901.0  | 3836.1  | 3792.5  | 3740.7  | 3722.5  | 3661.6  |
| 5°    | 4390.9  | 4392.9  | 4366.6  | 4348.3  | 4288.5  | 4215.4  | 4104.9  | 4004.5  | 3904.0  | 3863.5  | 3738.7  |
| 7.5°  | 4716.5  | 4712.4  | 4705.3  | 4690.1  | 4634.3  | 4559.3  | 4410.2  | 4261.1  | 4113.0  | 4052.1  | 3837.1  |
| 10°   | 4925.5  | 4934.6  | 4940.7  | 4947.8  | 4924.4  | 4870.7  | 4729.7  | 4548.1  | 4354.4  | 4271.2  | 3954.8  |
| 12.5° | 5030.9  | 5047.2  | 5075.6  | 5124.3  | 5162.8  | 5156.7  | 5054.3  | 4861.6  | 4631.3  | 4526.8  | 4101.8  |
| 15°   | 5092.8  | 5114.1  | 5158.7  | 5246.0  | 5354.5  | 5416.4  | 5389.0  | 5214.5  | 4957.9  | 4829.1  | 4281.4  |
| 17.5° | 5131.4  | 5148.6  | 5217.6  | 5334.2  | 5495.5  | 5659.8  | 5731.8  | 5585.8  | 5327.1  | 5180.0  | 4487.3  |
| 20°   | 5157.7  | 5170.9  | 5257.1  | 5394.1  | 5603.0  | 5864.7  | 6065.5  | 6029.0  | 5733.9  | 5543.2  | 4702.3  |
| 22.5° | 5216.6  | 5227.7  | 5309.9  | 5447.8  | 5679.1  | 6016.8  | 6387.1  | 6441.8  | 6162.9  | 5946.9  | 4932.6  |
| 25°   | 5380.9  | 5380.9  | 5449.8  | 5546.2  | 5763.3  | 6148.7  | 6658.9  | 6901.3  | 6601.1  | 6349.5  | 5145.6  |
| 27.5° | 5694.3  | 5691.3  | 5716.6  | 5750.1  | 5914.4  | 6282.6  | 6901.3  | 7307.0  | 7055.5  | 6780.6  | 5352.5  |
| 30°   | 6065.5  | 6085.8  | 6088.9  | 6072.6  | 6149.7  | 6449.9  | 7125.5  | 7735.1  | 7512.9  | 7216.8  | 5564.5  |
| 32.5° | 6543.3  | 6556.5  | 6541.2  | 6487.5  | 6476.3  | 6687.3  | 7345.6  | 8183.4  | 8007.9  | 7672.2  | 5758.2  |
| 35°   | 7149.8  | 7124.5  | 7076.8  | 6967.2  | 6862.8  | 7004.8  | 7597.1  | 8631.7  | 8563.8  | 8222.9  | 6025.0  |
| 37.5° | 7800.0  | 7801.0  | 7742.2  | 7493.7  | 7349.6  | 7410.5  | 7944.0  | 9139.9  | 9236.2  | 8878.2  | 6366.8  |
| 40°   | 8321.3  | 8348.7  | 8385.2  | 8058.6  | 7872.0  | 7956.2  | 8385.2  | 9729.2  | 10031.5 | 9655.1  | 6812.1  |
| 42.5° | 8685.5  | 8716.9  | 8820.4  | 8615.5  | 8421.8  | 8578.0  | 8904.6  | 10358.1 | 10924.0 | 10551.8 | 7333.4  |
| 45°   | 9070.9  | 9088.1  | 9161.2  | 9072.9  | 8949.2  | 9301.2  | 9489.8  | 11009.2 | 11868.4 | 11507.3 | 7916.6  |
| 47.5° | 9476.6  | 9494.9  | 9569.9  | 9511.1  | 9446.2  | 9976.7  | 10100.4 | 11622.9 | 12773.1 | 12557.1 | 8539.4  |
| 50°   | 9977.7  | 9989.9  | 10060.9 | 9954.4  | 9974.6  | 10485.9 | 10646.1 | 12185.8 | 13721.5 | 13500.4 | 9164.2  |
| 52.5° | 10661.3 | 10664.4 | 10762.8 | 10666.4 | 10571.1 | 10859.1 | 11115.7 | 12716.3 | 14465.0 | 14360.5 | 9789.0  |
| 55°   | 11196.9 | 11229.3 | 11551.9 | 11531.6 | 11476.8 | 11197.9 | 11508.3 | 13221.4 | 15128.3 | 15178.0 | 10452.4 |
| 57.5° | 10855.1 | 10981.9 | 11635.1 | 12095.6 | 12543.9 | 12040.8 | 12038.8 | 13790.5 | 15745.0 | 15980.3 | 11181.7 |
| 60°   | 9507.1  | 9679.5  | 10642.1 | 11663.5 | 13066.2 | 13507.5 | 13140.3 | 14485.3 | 16367.8 | 16775.5 | 12095.6 |
| 62.5° | 6789.7  | 7073.7  | 8378.1  | 10009.1 | 12350.1 | 14479.2 | 15381.9 | 15587.8 | 17214.7 | 17696.5 | 13283.3 |
| 65°   | 3432.4  | 3647.4  | 4740.8  | 6705.6  | 9867.1  | 13844.2 | 17818.3 | 18001.8 | 18686.5 | 19114.5 | 15112.1 |
| 67.5° | 2085.4  | 2166.5  | 2700.1  | 3729.6  | 6049.3  | 10784.1 | 18613.5 | 22025.6 | 21534.7 | 21761.9 | 17719.9 |
| 70°   | 1536.7  | 1596.5  | 1929.2  | 2476.9  | 3479.1  | 6328.2  | 16173.1 | 24897.1 | 24574.5 | 24549.2 | 19647.0 |
| 72°   | 1196.9  | 1240.5  | 1534.6  | 2001.2  | 2543.9  | 3796.5  | 11722.3 | 23837.1 | 25444.8 | 25317.0 | 19470.5 |
| 72.5° | 1135.0  | 1173.5  | 1441.3  | 1883.6  | 2403.9  | 3441.5  | 10539.6 | 23122.0 | 25381.9 | 25324.1 | 19242.3 |
| 75°   | 893.6   | 921.0   | 1067.0  | 1456.5  | 1881.5  | 1952.5  | 5775.4  | 17918.7 | 22516.5 | 23452.7 | 17307.0 |
| 77.5° | 739.4   | 743.5   | 820.6   | 1059.9  | 1466.7  | 1380.5  | 2837.0  | 12432.3 | 16123.4 | 17152.9 | 12259.9 |
| 80°   | 602.5   | 607.6   | 644.1   | 743.5   | 1109.6  | 1021.4  | 1347.0  | 7148.8  | 9027.3  | 9038.4  | 5830.2  |
| 82.5° | 479.8   | 480.8   | 521.4   | 543.7   | 797.2   | 730.3   | 771.9   | 3356.3  | 3944.6  | 3794.5  | 2095.5  |
| 85°   | 337.8   | 330.7   | 509.2   | 446.3   | 521.4   | 468.6   | 426.0   | 1328.7  | 1631.0  | 1560.0  | 656.3   |
| 87.5° | 112.6   | 116.6   | 226.2   | 289.1   | 304.3   | 265.7   | 189.7   | 509.2   | 615.7   | 610.6   | 207.9   |
| 90°   | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |

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**CANDELA DISTRIBUTION (continued):**

|       | 90°     | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 3624.1  | 3624.1 | 3624.1 | 3624.1 | 3624.1 | 3624.1 | 3624.1 | 3624.1 | 3624.1 | 3624.1 | 3624.1 |
| 2.5°  | 3642.4  | 3609.9 | 3562.2 | 3509.5 | 3467.9 | 3425.3 | 3393.9 | 3377.6 | 3359.4 | 3344.2 | 3362.4 |
| 5°    | 3680.9  | 3620.0 | 3518.6 | 3419.2 | 3346.2 | 3281.3 | 3234.6 | 3210.3 | 3188.0 | 3172.7 | 3174.8 |
| 7.5°  | 3743.8  | 3645.4 | 3475.0 | 3330.0 | 3228.5 | 3158.5 | 3110.9 | 3094.6 | 3080.4 | 3076.4 | 3081.5 |
| 10°   | 3810.7  | 3665.7 | 3417.2 | 3224.5 | 3108.8 | 3051.0 | 3029.7 | 3040.9 | 3051.0 | 3060.2 | 3070.3 |
| 12.5° | 3886.8  | 3683.9 | 3333.0 | 3100.7 | 3002.3 | 2980.0 | 3001.3 | 3050.0 | 3085.5 | 3106.8 | 3120.0 |
| 15°   | 3986.2  | 3700.2 | 3235.6 | 2977.0 | 2911.0 | 2936.4 | 3008.4 | 3092.6 | 3154.5 | 3194.0 | 3200.1 |
| 17.5° | 4077.5  | 3699.2 | 3110.9 | 2852.2 | 2837.0 | 2911.0 | 3019.6 | 3138.3 | 3221.4 | 3277.2 | 3288.4 |
| 20°   | 4171.8  | 3671.8 | 2965.8 | 2730.5 | 2761.9 | 2883.7 | 3024.6 | 3167.7 | 3268.1 | 3333.0 | 3348.2 |
| 22.5° | 4260.1  | 3624.1 | 2806.6 | 2619.9 | 2699.1 | 2847.1 | 3005.4 | 3150.4 | 3250.8 | 3303.6 | 3319.8 |
| 25°   | 4319.9  | 3540.9 | 2645.3 | 2526.6 | 2643.3 | 2802.5 | 2942.5 | 3059.1 | 3134.2 | 3160.6 | 3164.6 |
| 27.5° | 4350.3  | 3432.4 | 2493.2 | 2445.5 | 2585.5 | 2729.5 | 2825.8 | 2883.7 | 2905.0 | 2902.9 | 2898.9 |
| 30°   | 4354.4  | 3289.4 | 2362.3 | 2379.6 | 2518.5 | 2622.0 | 2667.6 | 2656.5 | 2629.1 | 2582.4 | 2586.5 |
| 32.5° | 4341.2  | 3128.1 | 2252.8 | 2316.7 | 2433.3 | 2491.1 | 2493.2 | 2439.4 | 2366.4 | 2292.3 | 2272.0 |
| 35°   | 4345.3  | 2969.9 | 2156.4 | 2245.7 | 2329.9 | 2355.2 | 2331.9 | 2252.8 | 2153.4 | 2058.0 | 2037.7 |
| 37.5° | 4389.9  | 2831.9 | 2073.2 | 2163.5 | 2215.2 | 2221.3 | 2187.9 | 2104.7 | 2031.6 | 1938.3 | 1930.2 |
| 40°   | 4496.4  | 2733.5 | 1994.1 | 2071.2 | 2100.6 | 2103.7 | 2056.0 | 1997.2 | 2003.2 | 1953.5 | 1952.5 |
| 42.5° | 4688.1  | 2690.9 | 1924.1 | 1974.8 | 1993.1 | 1999.2 | 1962.7 | 1925.1 | 1977.9 | 1945.4 | 1934.3 |
| 45°   | 4935.6  | 2701.1 | 1865.3 | 1880.5 | 1914.0 | 1942.4 | 1920.1 | 1874.4 | 1894.7 | 1753.7 | 1707.1 |
| 47.5° | 5221.6  | 2766.0 | 1818.6 | 1799.4 | 1857.2 | 1910.9 | 1876.5 | 1807.5 | 1735.5 | 1595.5 | 1569.1 |
| 50°   | 5556.3  | 2866.4 | 1776.0 | 1719.2 | 1795.3 | 1868.3 | 1833.9 | 1735.5 | 1626.9 | 1559.0 | 1549.9 |
| 52.5° | 5905.3  | 2989.1 | 1733.4 | 1631.0 | 1717.2 | 1835.9 | 1818.6 | 1719.2 | 1585.4 | 1518.4 | 1506.2 |
| 55°   | 6300.8  | 3112.9 | 1679.7 | 1528.6 | 1633.0 | 1820.7 | 1811.5 | 1660.4 | 1553.9 | 1516.4 | 1507.3 |
| 57.5° | 6792.8  | 3253.9 | 1608.7 | 1422.1 | 1553.9 | 1765.9 | 1737.5 | 1624.9 | 1521.5 | 1493.1 | 1490.0 |
| 60°   | 7433.8  | 3461.8 | 1506.2 | 1308.5 | 1457.6 | 1681.7 | 1675.6 | 1573.2 | 1469.7 | 1449.4 | 1445.4 |
| 62.5° | 8395.4  | 3805.7 | 1365.3 | 1194.8 | 1350.0 | 1538.7 | 1594.5 | 1503.2 | 1415.0 | 1413.9 | 1416.0 |
| 65°   | 9886.4  | 4323.0 | 1212.1 | 1095.4 | 1241.5 | 1418.0 | 1500.2 | 1431.2 | 1359.2 | 1379.5 | 1382.5 |
| 67.5° | 11614.8 | 4752.0 | 1062.0 | 998.1  | 1130.9 | 1303.4 | 1415.0 | 1359.2 | 1285.1 | 1337.9 | 1338.9 |
| 70°   | 12189.9 | 4368.6 | 930.1  | 901.7  | 1016.3 | 1192.8 | 1322.7 | 1280.0 | 1205.0 | 1257.7 | 1252.7 |
| 72°   | 11344.0 | 3526.7 | 844.9  | 828.7  | 930.1  | 1101.5 | 1240.5 | 1206.0 | 1132.0 | 1167.5 | 1154.3 |
| 72.5° | 11077.2 | 3362.4 | 823.6  | 810.4  | 906.8  | 1078.2 | 1219.2 | 1187.7 | 1113.7 | 1144.1 | 1132.0 |
| 75°   | 9881.3  | 2920.2 | 708.0  | 711.0  | 791.2  | 964.6  | 1099.5 | 1089.4 | 1013.3 | 1016.3 | 1012.3 |
| 77.5° | 7167.1  | 2141.2 | 596.4  | 616.7  | 673.5  | 848.0  | 978.8  | 972.7  | 889.5  | 874.3  | 871.3  |
| 80°   | 3325.9  | 1092.4 | 485.9  | 495.0  | 553.8  | 709.0  | 834.8  | 826.7  | 759.7  | 740.4  | 729.3  |
| 82.5° | 1139.1  | 519.3  | 365.1  | 371.2  | 429.0  | 571.1  | 724.2  | 719.1  | 663.4  | 625.8  | 602.5  |
| 85°   | 406.7   | 258.6  | 255.6  | 249.5  | 306.3  | 449.3  | 630.9  | 603.5  | 521.4  | 444.3  | 442.2  |
| 87.5° | 131.9   | 110.6  | 131.9  | 130.8  | 178.5  | 304.3  | 458.5  | 390.5  | 378.3  | 314.4  | 308.3  |
| 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: SP1-1908-441-2-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:  $4\pi$   
 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 |      |       |
| CIE u':                   | 0.2508 | R1:       | 67.5 | R9:  | -38.3 |
| CIE v':                   | 0.5215 | R2:       | 82.9 | R10: | 62.5  |
| Duv:                      | 0.0000 | R3:       | 94.7 | R11: | 63.7  |
| CIE x:                    | 0.4374 | R4:       | 67.7 | R12: | 57.8  |
| CIE y:                    | 0.4043 | R5:       | 67.9 | R13: | 70.4  |
| CIE z:                    | 0.1583 | R6:       | 77.6 | R14: | 97.3  |
| 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<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       | 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<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       | 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<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       | 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  $R_a = 71.8$   
 $R_g = -38.3$



**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)