

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: P321348

Luminaire Tested: **GLEON-SA4A-760-U-T2R-HSS**

Issue Date: 3/3/2020

### Test Information

Test Method: LM-79-08  
Report Number: P321348  
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-760-U-T2R-HSS  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(4) 70 CRI, 5700K, 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: 15174 lumens  
Efficiency: N/A  
Efficacy: 117.6 lumens/watt  
Luminous Opening: Rectangular (W 1' x L: 1' x H: 0')  
IES Classification: Type II - Medium  
BUG Rating: B1 - U0 - G2

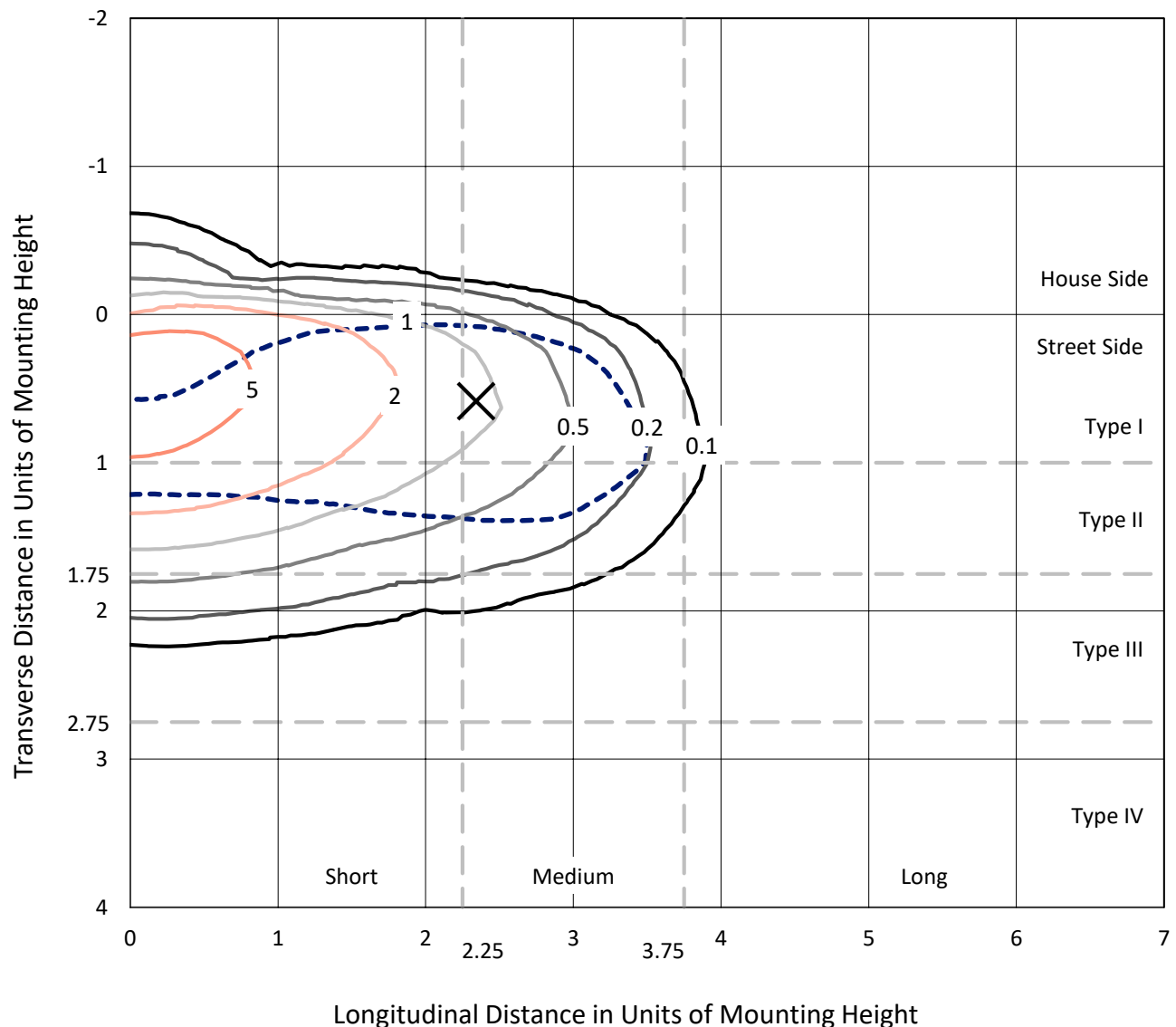
Input Watts (W): 129  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



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## Iso-Footcandle Lines of Horizontal Illumination

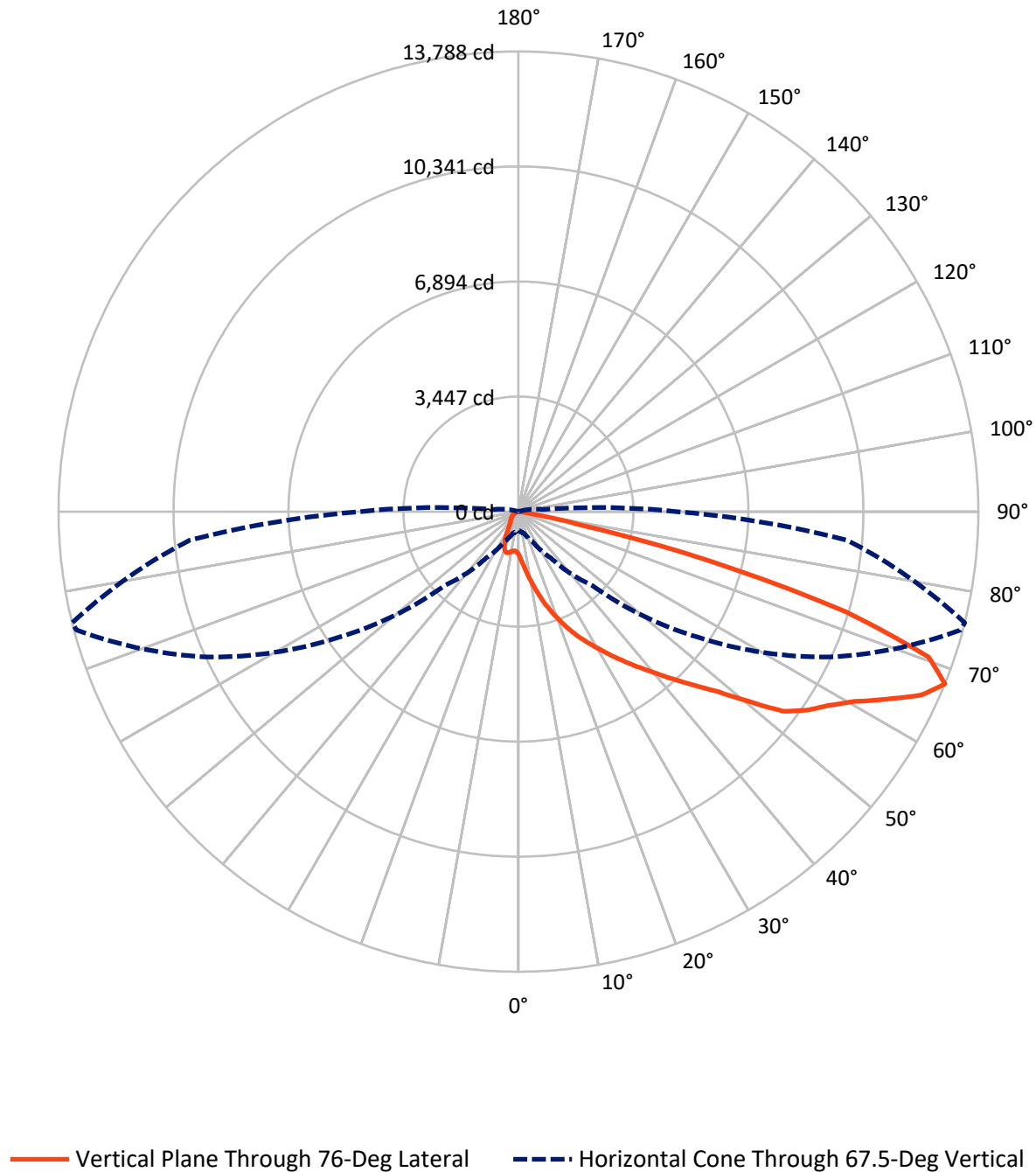
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 7.3 fc  
 Type II - 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    | 753.5    | 0.0    | 753.5   |
|                    | % Fixture | 5.0      | 0.0    | 5.0     |
| <b>Street Side</b> | Lumens    | 14420.5  | 0.0    | 14420.5 |
|                    | % Fixture | 95.0     | 0.0    | 95.0    |
| <b>Total</b>       | Lumens    | 15174.0  | 0.0    | 15174.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 160.1   | 1.1       |
| 10°-20°   | 634.5   | 4.2       |
| 20°-30°   | 1291.0  | 8.5       |
| 30°-40°   | 2240.8  | 14.8      |
| 40°-50°   | 3165.9  | 20.9      |
| 50°-60°   | 3590.3  | 23.7      |
| 60°-70°   | 2977.8  | 19.6      |
| 70°-80°   | 1078.6  | 7.1       |
| 80°-90°   | 35.0    | 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°    | 15174.0 | 100.0     |
| 0°-180°   | 15174.0 | 100.0     |

**Coefficient of Utilization**



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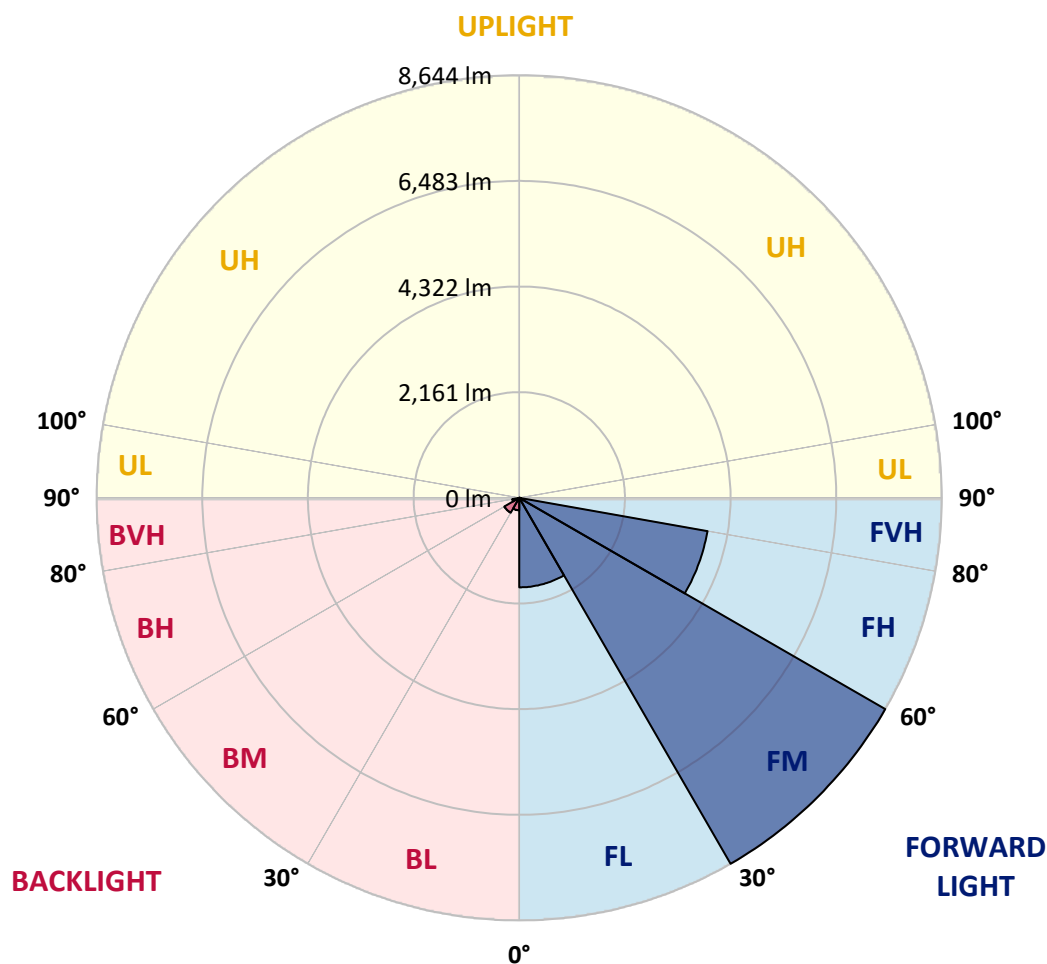
CATALOG NUMBER: GLEON-SA4A-760-U-T2R-HSS

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 1831.5 | 12.1      |                         |      |         |
| FM   | (30°-60°)   | 8644.3 | 57.0      |                         |      |         |
| FH   | (60°-80°)   | 3910.8 | 25.8      |                         |      | G2/5000 |
| FVH  | (80°-90°)   | 33.9   | 0.2       |                         |      | G1/100  |
| BL   | (0°-30°)    | 254.1  | 1.7       | B1/500                  |      |         |
| BM   | (30°-60°)   | 352.7  | 2.3       | B1/1000                 |      |         |
| BH   | (60°-80°)   | 145.6  | 1.0       | B1/500                  |      | G1/500  |
| BVH  | (80°-90°)   | 1.1    | 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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CATALOG NUMBER: GLEON-SA4A-760-U-T2R-HSS

**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°     | 65°     | 75°     | 76°     | 85°    |
|-------|--------|--------|--------|--------|--------|--------|---------|---------|---------|---------|--------|
| 0°    | 1287.2 | 1287.2 | 1287.2 | 1287.2 | 1287.2 | 1287.2 | 1287.2  | 1287.2  | 1287.2  | 1287.2  | 1287.2 |
| 2.5°  | 1921.5 | 1878.3 | 1888.2 | 1860.3 | 1809.8 | 1706.1 | 1617.6  | 1533.9  | 1436.1  | 1432.8  | 1352.4 |
| 5°    | 2591.0 | 2554.4 | 2549.8 | 2493.3 | 2401.5 | 2225.3 | 2053.8  | 1858.3  | 1640.2  | 1624.3  | 1453.4 |
| 7.5°  | 3198.7 | 3169.5 | 3158.8 | 3091.7 | 2920.8 | 2749.3 | 2525.9  | 2238.6  | 1897.5  | 1868.3  | 1589.7 |
| 10°   | 3665.4 | 3651.5 | 3654.1 | 3606.3 | 3460.0 | 3300.4 | 3007.2  | 2640.9  | 2189.4  | 2144.2  | 1753.3 |
| 12.5° | 4019.2 | 4022.5 | 4046.4 | 4017.2 | 3935.4 | 3817.0 | 3503.9  | 3069.7  | 2512.6  | 2450.7  | 1940.1 |
| 15°   | 4279.1 | 4295.7 | 4339.6 | 4376.2 | 4370.2 | 4267.8 | 3980.6  | 3505.2  | 2855.6  | 2787.1  | 2148.2 |
| 17.5° | 4447.3 | 4466.0 | 4529.8 | 4610.9 | 4685.4 | 4661.4 | 4440.7  | 3925.4  | 3202.7  | 3123.6  | 2370.9 |
| 20°   | 4594.9 | 4616.9 | 4685.4 | 4792.4 | 4931.4 | 4961.3 | 4816.3  | 4333.0  | 3549.1  | 3452.7  | 2601.0 |
| 22.5° | 4914.7 | 4914.1 | 4956.0 | 5018.5 | 5150.8 | 5227.9 | 5136.1  | 4711.3  | 3891.5  | 3791.1  | 2835.7 |
| 25°   | 5493.2 | 5471.2 | 5456.6 | 5407.4 | 5436.7 | 5484.5 | 5433.3  | 5065.0  | 4235.9  | 4134.2  | 3073.7 |
| 27.5° | 6180.7 | 6194.0 | 6075.6 | 5943.3 | 5840.9 | 5791.7 | 5707.9  | 5392.8  | 4567.0  | 4455.3  | 3306.4 |
| 30°   | 6906.0 | 6910.0 | 6770.4 | 6601.5 | 6376.1 | 6189.3 | 6044.4  | 5705.9  | 4907.4  | 4785.8  | 3532.5 |
| 32.5° | 7560.3 | 7534.3 | 7396.1 | 7166.0 | 6881.4 | 6671.3 | 6370.2  | 6055.7  | 5267.8  | 5150.1  | 3783.8 |
| 35°   | 8078.9 | 8048.3 | 7880.1 | 7670.6 | 7375.4 | 7164.0 | 6801.7  | 6404.7  | 5646.8  | 5531.7  | 4035.8 |
| 37.5° | 8457.9 | 8421.9 | 8249.1 | 8033.7 | 7779.0 | 7656.0 | 7302.3  | 6784.4  | 6060.3  | 5936.7  | 4301.1 |
| 40°   | 8589.5 | 8558.2 | 8449.9 | 8292.3 | 8087.5 | 8059.6 | 7833.5  | 7221.2  | 6510.4  | 6378.8  | 4601.6 |
| 42.5° | 8511.0 | 8480.5 | 8441.9 | 8388.7 | 8303.6 | 8330.2 | 8334.9  | 7719.2  | 7010.4  | 6880.8  | 4933.4 |
| 45°   | 8199.9 | 8172.6 | 8212.5 | 8290.3 | 8396.0 | 8527.7 | 8792.3  | 8254.4  | 7568.9  | 7430.6  | 5317.0 |
| 47.5° | 7741.8 | 7721.8 | 7832.2 | 8026.4 | 8335.5 | 8698.5 | 9210.5  | 8816.9  | 8195.9  | 8067.6  | 5795.7 |
| 50°   | 7090.2 | 7086.9 | 7307.6 | 7662.0 | 8137.4 | 8781.0 | 9642.7  | 9456.5  | 9066.9  | 8931.9  | 6461.2 |
| 52.5° | 6075.6 | 6082.3 | 6516.4 | 7083.6 | 7789.7 | 8725.1 | 9920.6  | 10278.3 | 10080.1 | 9939.9  | 7037.7 |
| 55°   | 5109.6 | 5149.4 | 5457.3 | 6275.1 | 7256.4 | 8517.7 | 10016.3 | 10661.9 | 10639.3 | 10506.3 | 7358.2 |
| 57.5° | 4163.4 | 4235.9 | 4532.4 | 5296.4 | 6477.9 | 8039.6 | 9963.8  | 10828.1 | 11055.5 | 10953.8 | 7781.0 |
| 60°   | 3138.2 | 3171.4 | 3513.2 | 4227.3 | 5478.6 | 7167.3 | 9582.8  | 10918.5 | 11624.6 | 11554.2 | 8394.7 |
| 62.5° | 1996.6 | 2079.7 | 2382.9 | 3071.7 | 4265.8 | 5955.9 | 8940.6  | 10917.2 | 12336.7 | 12375.3 | 9186.6 |
| 65°   | 1051.8 | 1148.9 | 1309.8 | 1903.5 | 2931.4 | 4602.9 | 7974.5  | 10814.8 | 13210.4 | 13264.2 | 9805.6 |
| 67.5° | 567.1  | 595.1  | 680.2  | 988.0  | 1700.1 | 3118.3 | 6555.0  | 10309.5 | 13716.3 | 13787.5 | 9892.0 |
| 70°   | 414.9  | 430.2  | 462.1  | 546.5  | 855.7  | 1811.1 | 4783.1  | 9163.9  | 13064.1 | 13037.5 | 8789.0 |
| 72.5° | 318.5  | 342.4  | 366.3  | 400.3  | 492.0  | 966.7  | 2978.0  | 7176.0  | 10423.9 | 10248.4 | 6569.6 |
| 75°   | 251.3  | 255.3  | 289.2  | 319.8  | 369.0  | 550.5  | 1322.4  | 4179.4  | 6362.2  | 5946.6  | 3406.8 |
| 77.5° | 200.8  | 203.5  | 223.4  | 250.0  | 296.5  | 361.7  | 409.6   | 1644.2  | 2031.2  | 1812.4  | 739.3  |
| 80°   | 119.0  | 125.7  | 166.2  | 192.8  | 246.0  | 228.1  | 149.6   | 357.0   | 317.1   | 287.2   | 124.3  |
| 82.5° | 66.5   | 71.8   | 93.7   | 152.3  | 171.5  | 109.0  | 74.5    | 96.4    | 74.5    | 72.5    | 35.2   |
| 85°   | 0.0    | 3.3    | 60.5   | 94.4   | 69.8   | 23.9   | 31.2    | 31.9    | 21.9    | 20.6    | 14.0   |
| 87.5° | 0.0    | 0.0    | 18.6   | 18.0   | 2.7    | 4.0    | 7.3     | 10.6    | 8.6     | 8.6     | 7.3    |
| 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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CATALOG NUMBER: GLEON-SA4A-760-U-T2R-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1287.2 | 1287.2 | 1287.2 | 1287.2 | 1287.2 | 1287.2 | 1287.2 | 1287.2 | 1287.2 | 1287.2 | 1287.2 |
| 2.5°  | 1312.5 | 1276.6 | 1208.7 | 1142.3 | 1086.4 | 1040.5 | 999.3  | 982.7  | 969.4  | 967.4  | 956.8  |
| 5°    | 1371.0 | 1298.5 | 1168.8 | 1062.5 | 991.3  | 940.8  | 897.6  | 871.0  | 850.4  | 842.4  | 835.1  |
| 7.5°  | 1459.4 | 1349.7 | 1163.5 | 1041.2 | 956.1  | 871.0  | 791.2  | 704.8  | 650.9  | 630.3  | 618.3  |
| 10°   | 1567.1 | 1417.5 | 1183.5 | 1035.2 | 886.3  | 706.8  | 574.5  | 464.7  | 420.2  | 405.6  | 401.6  |
| 12.5° | 1692.8 | 1501.9 | 1218.0 | 998.0  | 737.3  | 502.0  | 396.3  | 359.0  | 349.1  | 344.4  | 344.4  |
| 15°   | 1837.0 | 1594.4 | 1242.6 | 890.3  | 545.2  | 379.6  | 343.1  | 325.8  | 315.1  | 309.2  | 309.8  |
| 17.5° | 1984.6 | 1684.8 | 1230.7 | 734.0  | 402.2  | 337.8  | 310.5  | 291.9  | 277.3  | 271.3  | 269.9  |
| 20°   | 2133.6 | 1768.6 | 1164.2 | 546.5  | 340.4  | 306.5  | 275.9  | 255.3  | 240.7  | 234.7  | 233.4  |
| 22.5° | 2287.8 | 1839.7 | 1047.2 | 400.9  | 305.8  | 271.9  | 242.0  | 221.4  | 207.4  | 202.1  | 199.5  |
| 25°   | 2438.1 | 1897.5 | 883.6  | 324.5  | 273.3  | 239.4  | 210.8  | 191.5  | 178.9  | 173.5  | 172.9  |
| 27.5° | 2578.4 | 1934.1 | 694.1  | 286.6  | 244.7  | 210.1  | 184.2  | 166.9  | 156.2  | 152.3  | 151.6  |
| 30°   | 2704.7 | 1937.4 | 513.3  | 258.6  | 219.4  | 184.8  | 160.9  | 145.6  | 136.3  | 132.3  | 131.0  |
| 32.5° | 2832.4 | 1909.5 | 373.7  | 233.4  | 196.1  | 162.9  | 139.6  | 127.7  | 121.0  | 117.7  | 117.7  |
| 35°   | 2952.7 | 1845.0 | 291.2  | 211.4  | 173.5  | 141.6  | 123.0  | 114.4  | 110.4  | 107.0  | 107.0  |
| 37.5° | 3070.4 | 1752.6 | 247.3  | 192.1  | 152.3  | 123.7  | 108.4  | 103.1  | 99.7   | 96.4   | 96.4   |
| 40°   | 3190.1 | 1636.3 | 224.7  | 174.2  | 135.0  | 109.7  | 96.4   | 91.8   | 88.4   | 85.8   | 85.1   |
| 42.5° | 3337.0 | 1501.9 | 210.1  | 157.6  | 119.7  | 97.1   | 85.1   | 79.8   | 77.1   | 74.5   | 73.1   |
| 45°   | 3507.2 | 1386.3 | 198.1  | 141.0  | 107.0  | 86.4   | 73.8   | 68.5   | 64.5   | 61.2   | 60.5   |
| 47.5° | 3752.5 | 1302.5 | 182.2  | 123.0  | 95.1   | 75.1   | 63.8   | 57.8   | 51.9   | 48.5   | 47.9   |
| 50°   | 4065.7 | 1233.3 | 161.6  | 107.0  | 83.1   | 63.8   | 53.2   | 45.9   | 40.6   | 37.2   | 37.2   |
| 52.5° | 4221.3 | 1142.9 | 142.9  | 93.1   | 69.8   | 53.9   | 43.2   | 34.6   | 31.9   | 28.6   | 28.6   |
| 55°   | 4283.8 | 1073.8 | 124.3  | 79.1   | 57.8   | 44.5   | 33.9   | 26.6   | 24.6   | 22.6   | 21.9   |
| 57.5° | 4459.3 | 1053.8 | 108.4  | 67.2   | 47.9   | 35.2   | 25.9   | 19.9   | 18.6   | 16.0   | 16.0   |
| 60°   | 4741.9 | 1063.8 | 93.7   | 57.2   | 38.6   | 27.3   | 19.3   | 15.3   | 14.0   | 11.3   | 11.3   |
| 62.5° | 5047.1 | 1051.2 | 79.1   | 49.2   | 29.9   | 19.9   | 13.3   | 11.3   | 11.3   | 6.6    | 6.0    |
| 65°   | 5105.6 | 936.1  | 67.8   | 40.6   | 23.3   | 14.6   | 8.6    | 7.3    | 10.0   | 1.3    | 0.0    |
| 67.5° | 4738.6 | 726.0  | 58.5   | 31.2   | 17.3   | 11.3   | 6.6    | 3.3    | 8.6    | 0.0    | 0.0    |
| 70°   | 3789.1 | 461.4  | 47.2   | 22.6   | 13.3   | 9.3    | 5.3    | 1.3    | 6.6    | 0.0    | 0.0    |
| 72.5° | 2679.4 | 267.9  | 37.2   | 16.0   | 11.3   | 7.3    | 4.0    | 0.0    | 4.0    | 0.0    | 0.0    |
| 75°   | 1355.0 | 142.9  | 23.3   | 12.0   | 8.6    | 5.3    | 2.7    | 0.0    | 0.7    | 0.0    | 0.0    |
| 77.5° | 293.2  | 66.5   | 14.6   | 8.6    | 6.0    | 3.3    | 1.3    | 0.0    | 0.0    | 0.0    | 0.0    |
| 80°   | 63.8   | 29.3   | 9.3    | 5.3    | 3.3    | 2.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 82.5° | 23.3   | 15.3   | 4.7    | 2.7    | 1.3    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 85°   | 12.6   | 8.0    | 2.7    | 1.3    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 87.5° | 6.6    | 2.7    | 0.7    | 0.7    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

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

Report Prepared for

Cooper Lighting Solutions

McGRAW-EDISON

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

Test Date: 10/23/2019

Luminaire Tested: SA1C-760-U-5WQ

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

### Test Information

Test Method: LM-79-2008  
 Report Number: SP1-1908-441-9-R4  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry:  $4\pi$   
 Issue Date: 10/28/2024  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: MCGRAW-EDISON  
 Catalog Number: **SA1C-760-U-5WQ**  
 Description: MCGRAW EDISON ROADWAY AND AREA LUMINAIRE

\*\*\*THIS IS A REVISION OF SP1-1908-441-4-R3. TO UPDATE THE CATALOG INFORMATION.\*\*\*TESTED IN SITU. ROADWAY AND AREA LUMINAIRE. (1) 70 CRI, 5000K, 1050MA LIGHTSQUARE WITH 16 LEDS AND TYPE V WIDE OPTICS.

### Spectral Parameters

|                           |        |           |      |      |       |
|---------------------------|--------|-----------|------|------|-------|
| CCT (K):                  | 5474   | CRI (Ra): | 71.7 |      |       |
| CIE u':                   | 0.2052 | R1:       | 70.6 | R9:  | -27.1 |
| CIE v':                   | 0.4804 | R2:       | 74.6 | R10: | 40.8  |
| Duv:                      | 0.0025 | R3:       | 78.3 | R11: | 74.6  |
| CIE x:                    | 0.3330 | R4:       | 73.8 | R12: | 50.4  |
| CIE y:                    | 0.3466 | R5:       | 72.4 | R13: | 70.0  |
| CIE z:                    | 0.3204 | R6:       | 67.5 | R14: | 87.8  |
| Peak Wavelength (nm):     | 442    | R7:       | 77.5 |      |       |
| Dominant Wavelength (nm): | 554    | R8:       | 58.9 |      |       |
| Purity:                   | 4.1    |           |      |      |       |
| Rf:                       | 72.1   |           |      |      |       |
| Rg:                       | 97.2   |           |      |      |       |



### Test Conditions

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

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| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | IN0058                | 6/28/2019        | 12/28/2019           |
| Power Meter                    | IN0071                | 12/5/2018        | 12/5/2019            |
| AC Power Source                | IN0063                | 12/5/2018        | 12/5/2019            |
| DC Power Source                | IN0208                | 12/5/2018        | 12/5/2019            |
| Sphere Thermometer             | IN0085                | 12/5/2018        | 12/5/2019            |
| Room Thermometer               | IN0046                | 12/5/2018        | 12/5/2019            |

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

CIE 1931 Chromaticity Diagram



CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles



Point lies inside the ANSI 5700K 4-step quadrangle

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

**Photopic Flux vs. Wavelength**



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

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**Scotopic Flux vs. Wavelength**



**Scotopic Lumens: 13759.3**

**S/P: 1.85**

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

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**Melanopic Flux vs. Wavelength**



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

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

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**TM-30-18**

**Summary**

$R_f = 72.1$   
 $R_g = 97.2$   
 CIE  $R_a = 71.7$   
 $R_9 = -27.1$



**Color Vector Graphics**



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

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



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Color Rendition by Hue-Angle Bin



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**Measure Comparisons**



(END OF REPORT)