

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: P321054

Luminaire Tested: **GLEON-SA0C-760-U-AFL**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P321054  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-29)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA0C-760-U-AFL  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(10) 70 CRI, 5700K, 1050mA LIGHTSQUARES WITH 16 LEDS EACH AND AUTOMOTIVE  
FRONTLINE OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 71823 lumens  
Efficiency: N/A  
Efficacy: 128.7 lumens/watt  
Luminous Opening: Rectangular (W 2.5' x L: 1' x H: 0')  
IES Classification: Type II - Short  
BUG Rating: B4 - U0 - G4

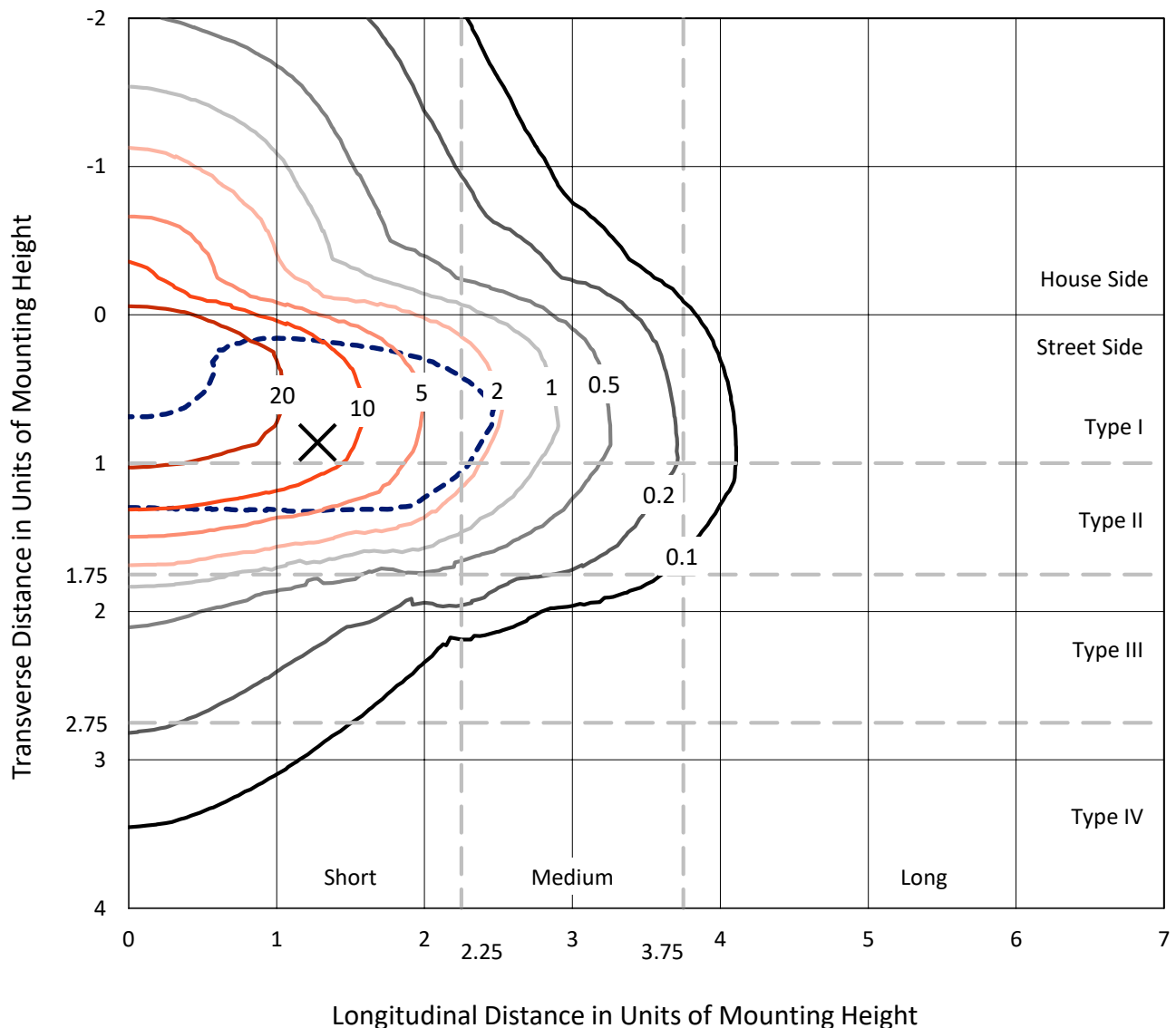
Input Watts (W): 558  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



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 CATALOG NUMBER: GLEON-SA0C-760-U-AFL

## Iso-Footcandle Lines of Horizontal Illumination

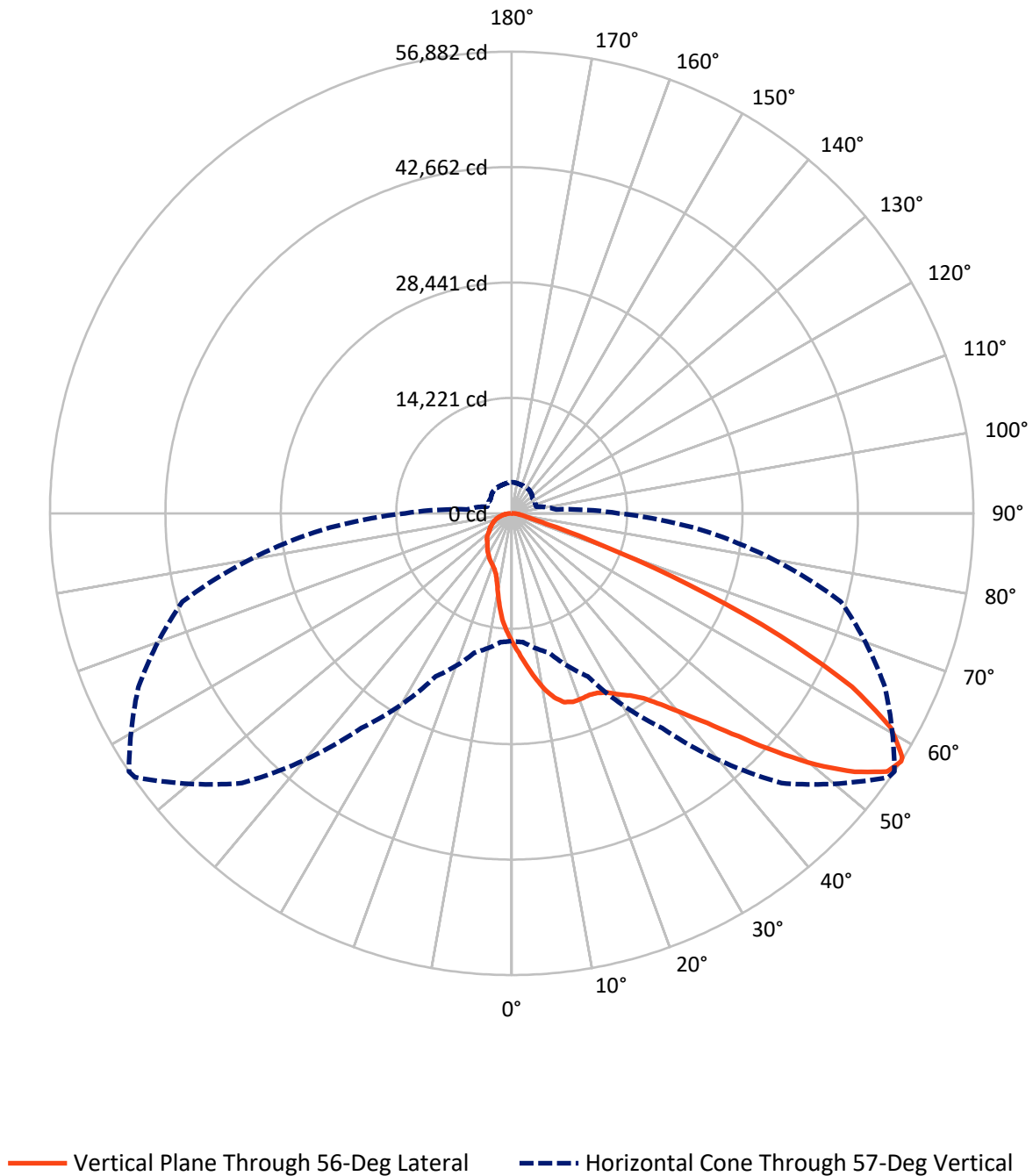
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 35.3 fc  
 Type II - Short - N/A

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## Luminous Intensity Polar Plot



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**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 12380.7  | 0.0    | 12380.7 |
|                    | % Fixture | 17.2     | 0.0    | 17.2    |
| <b>Street Side</b> | Lumens    | 59442.2  | 0.0    | 59442.2 |
|                    | % Fixture | 82.8     | 0.0    | 82.8    |
| <b>Total</b>       | Lumens    | 71823.0  | 0.0    | 71823.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 1521.8  | 2.1       |
| 10°-20°   | 4302.3  | 6.0       |
| 20°-30°   | 7007.7  | 9.8       |
| 30°-40°   | 10475.7 | 14.6      |
| 40°-50°   | 15889.5 | 22.1      |
| 50°-60°   | 17809.3 | 24.8      |
| 60°-70°   | 10518.9 | 14.6      |
| 70°-80°   | 3446.4  | 4.8       |
| 80°-90°   | 851.5   | 1.2       |
| 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°    | 71823.0 | 100.0     |
| 0°-180°   | 71823.0 | 100.0     |

**Coefficient of Utilization**



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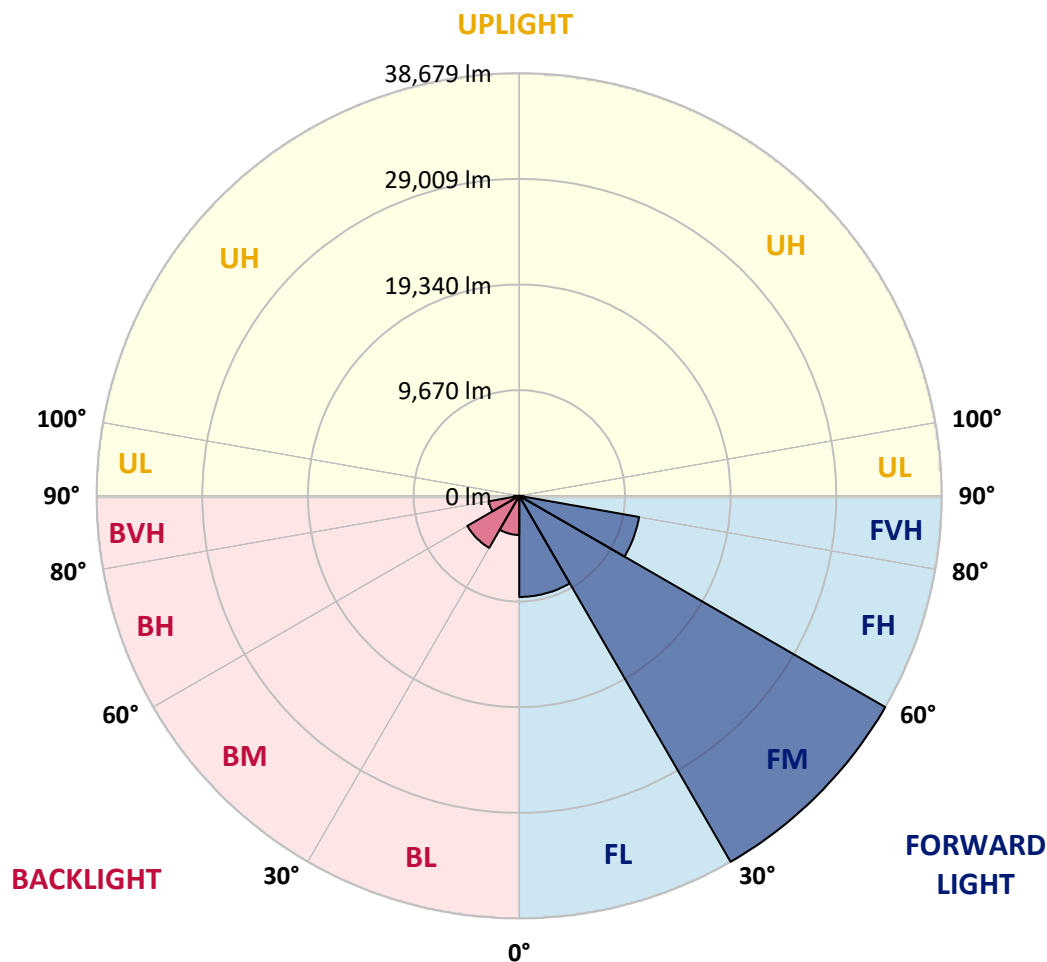
CATALOG NUMBER: GLEON-SA0C-760-U-AFL

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

| Zone |             | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |          |
|------|-------------|---------|-----------|-------------------------|------|----------|
|      |             |         |           | B                       | U    | G        |
| FL   | (0°-30°)    | 9251.9  | 12.9      |                         |      |          |
| FM   | (30°-60°)   | 38679.1 | 53.9      |                         |      |          |
| FH   | (60°-80°)   | 11136.4 | 15.5      |                         |      | G4/12000 |
| FVH  | (80°-90°)   | 374.9   | 0.5       |                         |      | G3/500   |
| BL   | (0°-30°)    | 3579.9  | 5.0       | B4/5000                 |      |          |
| BM   | (30°-60°)   | 5495.4  | 7.7       | B4/8500                 |      |          |
| BH   | (60°-80°)   | 2828.9  | 3.9       | B4/5000                 |      | G4/5000  |
| BVH  | (80°-90°)   | 476.6   | 0.7       |                         |      | G3/500   |
| UL   | (90°-100°)  | 0.0     | 0.0       |                         | U0/0 |          |
| UH   | (100°-180°) | 0.0     | 0.0       |                         | U0/0 |          |

**BUG Rating: B4-U0-G4**

Type II Short





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CATALOG NUMBER: GLEON-SA0C-760-U-AFL

**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 45°     | 55°     | 56°     | 65°     | 75°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 15930.4 | 15930.4 | 15930.4 | 15930.4 | 15930.4 | 15930.4 | 15930.4 | 15930.4 | 15930.4 | 15930.4 | 15930.4 |
| 2.5°  | 18292.6 | 18460.4 | 18386.4 | 18129.7 | 17932.2 | 17653.3 | 17342.3 | 17248.5 | 16920.2 | 16552.4 | 16110.6 |
| 5°    | 21187.9 | 21104.0 | 20983.0 | 20583.2 | 20161.1 | 19669.9 | 18889.9 | 18766.5 | 18035.9 | 17204.0 | 16325.3 |
| 7.5°  | 22836.7 | 22829.3 | 22757.7 | 22523.2 | 22138.2 | 21496.4 | 20556.0 | 20410.4 | 19307.0 | 17969.2 | 16606.7 |
| 10°   | 22597.3 | 22580.0 | 22698.5 | 22942.8 | 23058.9 | 22925.6 | 22133.2 | 21987.6 | 20632.5 | 18815.8 | 16932.5 |
| 12.5° | 21237.3 | 21247.1 | 21437.2 | 21950.6 | 22649.1 | 23488.3 | 23360.0 | 23288.4 | 22007.4 | 19773.5 | 17327.5 |
| 15°   | 20178.4 | 20200.6 | 20351.1 | 20797.9 | 21622.3 | 23145.2 | 24105.4 | 24130.1 | 23337.8 | 20830.0 | 17789.0 |
| 17.5° | 19714.3 | 19761.2 | 19830.3 | 20143.8 | 20899.1 | 22461.5 | 24283.1 | 24416.4 | 24502.8 | 21925.9 | 18233.3 |
| 20°   | 19862.4 | 19906.8 | 19926.6 | 20126.5 | 20746.1 | 22046.9 | 24159.7 | 24399.1 | 25396.3 | 22957.7 | 18677.6 |
| 22.5° | 20526.4 | 20553.5 | 20565.9 | 20617.7 | 21099.0 | 22165.3 | 24078.3 | 24330.0 | 26043.0 | 23883.3 | 19013.3 |
| 25°   | 21627.2 | 21607.5 | 21528.5 | 21461.9 | 21785.2 | 22634.3 | 24265.9 | 24505.3 | 26568.8 | 24722.5 | 19233.0 |
| 27.5° | 22945.3 | 22920.6 | 22767.6 | 22584.9 | 22770.1 | 23364.9 | 24806.4 | 24996.5 | 27040.2 | 25507.4 | 19344.1 |
| 30°   | 24527.5 | 24463.3 | 24174.5 | 23957.3 | 24028.9 | 24460.9 | 25697.5 | 25870.3 | 27768.4 | 26398.5 | 19452.7 |
| 32.5° | 26356.5 | 26287.4 | 25870.3 | 25509.9 | 25509.9 | 25870.3 | 26615.7 | 26758.8 | 28385.4 | 27405.5 | 19627.9 |
| 35°   | 28647.1 | 28560.7 | 28017.7 | 27412.9 | 27242.6 | 27425.3 | 27867.1 | 27968.3 | 29496.2 | 28674.2 | 19946.3 |
| 37.5° | 31347.4 | 31231.4 | 30527.9 | 29718.3 | 29345.6 | 29335.7 | 29654.2 | 29861.5 | 31270.9 | 30340.3 | 20486.9 |
| 40°   | 34055.1 | 33973.7 | 33359.1 | 32722.3 | 31991.6 | 31757.1 | 32248.3 | 32312.5 | 33591.1 | 32408.8 | 21178.0 |
| 42.5° | 36148.3 | 36133.4 | 36019.9 | 36103.8 | 35355.9 | 34882.0 | 35267.1 | 35318.9 | 36424.7 | 34647.5 | 21913.6 |
| 45°   | 37254.0 | 37278.7 | 37829.2 | 39048.5 | 39325.0 | 38979.4 | 39169.4 | 39184.3 | 39663.1 | 36906.0 | 22587.4 |
| 47.5° | 36367.9 | 36496.3 | 37888.4 | 40615.9 | 42879.3 | 44027.1 | 43711.1 | 43893.8 | 42802.8 | 38846.1 | 23115.6 |
| 50°   | 32914.8 | 33072.7 | 35442.3 | 39917.3 | 44538.0 | 48911.8 | 48746.5 | 48704.5 | 45335.3 | 40267.8 | 23402.0 |
| 52.5° | 28637.2 | 28760.6 | 30715.5 | 36286.5 | 43321.1 | 51612.1 | 53130.2 | 52912.9 | 47586.4 | 41331.7 | 23456.3 |
| 55°   | 22123.4 | 22315.9 | 24189.3 | 29039.5 | 38399.3 | 50580.4 | 56353.8 | 56158.8 | 49637.5 | 41889.5 | 23392.1 |
| 57°   | 15728.0 | 15930.4 | 17791.5 | 22162.9 | 32302.6 | 47008.8 | 56674.6 | 56882.0 | 50745.8 | 41983.3 | 23463.7 |
| 57.5° | 14034.8 | 14242.1 | 16085.9 | 20331.4 | 30402.0 | 45717.8 | 56398.2 | 56743.7 | 50945.7 | 41968.5 | 23503.2 |
| 60°   | 7066.7  | 7145.7  | 8320.6  | 11349.2 | 19218.2 | 36960.3 | 52792.0 | 53683.1 | 51125.9 | 41242.8 | 23673.5 |
| 62.5° | 4393.6  | 4336.8  | 4299.8  | 5227.9  | 9349.9  | 24510.2 | 45350.1 | 47065.5 | 47677.7 | 39485.4 | 23261.3 |
| 65°   | 3862.9  | 3756.8  | 3349.5  | 3275.4  | 4129.5  | 11904.6 | 34151.4 | 36286.5 | 40309.8 | 36716.0 | 22278.9 |
| 67.5° | 3628.4  | 3524.7  | 3065.6  | 2789.2  | 2791.6  | 4719.4  | 21202.7 | 23606.8 | 31401.7 | 32033.6 | 19961.1 |
| 70°   | 3386.5  | 3292.7  | 2863.2  | 2537.4  | 2377.0  | 2613.9  | 9754.7  | 11578.8 | 20469.6 | 25179.1 | 16683.2 |
| 72.5° | 3075.5  | 3011.3  | 2604.1  | 2268.4  | 2098.1  | 1957.4  | 3734.5  | 4410.9  | 11850.3 | 16910.3 | 11586.2 |
| 75°   | 2749.7  | 2690.4  | 2342.4  | 2021.5  | 1814.2  | 1540.2  | 2103.0  | 2265.9  | 6020.2  | 8651.4  | 5704.2  |
| 77.5° | 2391.8  | 2357.2  | 2083.2  | 1787.0  | 1621.7  | 1276.1  | 1488.4  | 1567.4  | 2581.8  | 3709.9  | 2860.8  |
| 80°   | 1903.1  | 1969.7  | 1821.6  | 1592.1  | 1439.0  | 1021.9  | 1054.0  | 1105.8  | 1503.2  | 1811.7  | 1624.1  |
| 82.5° | 1239.1  | 1355.1  | 1426.7  | 1293.4  | 1184.8  | 804.7   | 757.8   | 780.0   | 979.9   | 1105.8  | 705.9   |
| 85°   | 515.9   | 580.1   | 938.0   | 846.6   | 787.4   | 587.5   | 508.5   | 518.3   | 607.2   | 629.4   | 288.8   |
| 87.5° | 229.6   | 244.4   | 412.2   | 387.5   | 333.2   | 202.4   | 217.2   | 237.0   | 323.3   | 306.1   | 111.1   |
| 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°    | 15930.4 | 15930.4 | 15930.4 | 15930.4 | 15930.4 | 15930.4 | 15930.4 | 15930.4 | 15930.4 | 15930.4 | 15930.4 |
| 2.5°  | 15945.2 | 15737.9 | 15382.4 | 14990.0 | 14669.1 | 14412.4 | 14153.2 | 13975.5 | 13768.2 | 13657.1 | 13600.3 |
| 5°    | 15957.6 | 15550.3 | 14802.4 | 14034.8 | 13348.6 | 12721.6 | 12124.3 | 11665.2 | 11235.7 | 11003.7 | 10939.5 |
| 7.5°  | 16009.4 | 15397.3 | 14187.8 | 12924.0 | 11704.7 | 10591.5 | 9732.5  | 9194.4  | 8806.9  | 8634.1  | 8584.7  |
| 10°   | 16051.4 | 15217.1 | 13427.6 | 11556.6 | 9897.9  | 8769.9  | 8103.4  | 7802.3  | 7669.0  | 7646.8  | 7624.6  |
| 12.5° | 16150.1 | 15031.9 | 12627.8 | 10129.9 | 8493.4  | 7713.4  | 7481.4  | 7461.7  | 7498.7  | 7553.0  | 7553.0  |
| 15°   | 16305.6 | 14849.3 | 11714.6 | 8905.6  | 7599.9  | 7325.9  | 7372.8  | 7481.4  | 7582.6  | 7666.5  | 7678.9  |
| 17.5° | 16419.1 | 14624.7 | 10732.2 | 7925.7  | 7123.5  | 7197.6  | 7365.4  | 7518.4  | 7622.1  | 7703.6  | 7711.0  |
| 20°   | 16500.6 | 14276.6 | 9683.1  | 7177.8  | 6849.5  | 7079.1  | 7288.9  | 7424.6  | 7496.2  | 7577.7  | 7590.0  |
| 22.5° | 16458.6 | 13810.1 | 8752.6  | 6642.2  | 6627.4  | 6906.3  | 7106.2  | 7269.1  | 7214.8  | 7135.9  | 7187.7  |
| 25°   | 16256.2 | 13168.4 | 7794.9  | 6242.3  | 6392.9  | 6674.3  | 6921.1  | 6812.5  | 6629.9  | 6595.3  | 6615.0  |
| 27.5° | 15895.9 | 12348.9 | 6908.8  | 5872.1  | 6121.4  | 6459.5  | 6444.7  | 6336.1  | 6271.9  | 6227.5  | 6254.7  |
| 30°   | 15508.3 | 11460.3 | 6133.7  | 5548.7  | 5820.3  | 6099.2  | 6042.4  | 6039.9  | 5975.8  | 5904.2  | 5938.7  |
| 32.5° | 15125.7 | 10566.8 | 5519.1  | 5282.2  | 5593.2  | 5630.2  | 5753.6  | 5790.6  | 5664.7  | 5514.2  | 5504.3  |
| 35°   | 14792.5 | 9722.6  | 5052.6  | 5040.3  | 5319.2  | 5324.1  | 5504.3  | 5452.5  | 5139.0  | 4983.5  | 4983.5  |
| 37.5° | 14543.2 | 8880.9  | 4697.2  | 4823.1  | 4958.8  | 5087.2  | 5178.5  | 4963.8  | 4911.9  | 4825.5  | 4823.1  |
| 40°   | 14434.6 | 8140.5  | 4475.0  | 4657.7  | 4704.6  | 4867.5  | 4633.0  | 4716.9  | 4741.6  | 4697.2  | 4697.2  |
| 42.5° | 14321.1 | 7496.2  | 4282.5  | 4531.8  | 4524.4  | 4502.2  | 4383.7  | 4492.3  | 4591.0  | 4593.5  | 4586.1  |
| 45°   | 14207.5 | 6940.9  | 4112.2  | 4262.8  | 4366.4  | 4127.0  | 4149.2  | 4265.2  | 4403.4  | 4452.8  | 4452.8  |
| 47.5° | 14081.7 | 6501.5  | 3956.7  | 3978.9  | 4139.3  | 3978.9  | 3961.6  | 4050.5  | 4213.4  | 4292.4  | 4309.7  |
| 50°   | 13805.2 | 6106.6  | 3779.0  | 3729.6  | 3774.0  | 3828.3  | 3843.1  | 3885.1  | 4065.3  | 4191.2  | 4220.8  |
| 52.5° | 13422.6 | 5753.6  | 3551.9  | 3500.0  | 3500.0  | 3704.9  | 3774.0  | 3786.4  | 3939.4  | 4090.0  | 4119.6  |
| 55°   | 13104.2 | 5529.0  | 3317.4  | 3307.5  | 3297.6  | 3574.1  | 3692.6  | 3712.3  | 3818.5  | 3936.9  | 3951.7  |
| 57°   | 13126.4 | 5511.7  | 3137.2  | 3147.1  | 3144.6  | 3440.8  | 3616.1  | 3658.0  | 3712.3  | 3813.5  | 3830.8  |
| 57.5° | 13138.8 | 5524.1  | 3097.7  | 3102.7  | 3100.2  | 3403.8  | 3593.8  | 3640.7  | 3682.7  | 3788.8  | 3806.1  |
| 60°   | 13323.9 | 5556.1  | 2937.3  | 2883.0  | 2895.3  | 3206.3  | 3468.0  | 3527.2  | 3554.4  | 3695.0  | 3717.3  |
| 62.5° | 13049.9 | 5413.0  | 2808.9  | 2678.1  | 2678.1  | 2999.0  | 3292.7  | 3386.5  | 3428.5  | 3618.5  | 3655.6  |
| 65°   | 12255.1 | 5010.6  | 2658.4  | 2446.1  | 2470.8  | 2791.6  | 3082.9  | 3235.9  | 3300.1  | 3537.1  | 3576.6  |
| 67.5° | 11028.4 | 4544.1  | 2497.9  | 2238.7  | 2263.4  | 2574.4  | 2865.7  | 3031.1  | 3132.3  | 3448.2  | 3480.3  |
| 70°   | 9431.4  | 3974.0  | 2280.7  | 2019.1  | 2048.7  | 2337.5  | 2609.0  | 2796.6  | 2947.1  | 3364.3  | 3374.2  |
| 72.5° | 6953.2  | 3258.2  | 1977.1  | 1777.2  | 1809.3  | 2061.0  | 2349.8  | 2567.0  | 2769.4  | 3154.5  | 3149.6  |
| 75°   | 4134.4  | 2547.3  | 1641.4  | 1532.8  | 1555.0  | 1789.5  | 2115.3  | 2379.4  | 2683.0  | 3073.0  | 3119.9  |
| 77.5° | 2507.8  | 1917.9  | 1337.8  | 1283.5  | 1310.7  | 1550.1  | 1947.5  | 2228.9  | 2646.0  | 2897.8  | 2883.0  |
| 80°   | 1515.5  | 1369.9  | 1068.8  | 1034.2  | 1061.4  | 1325.5  | 1801.9  | 2115.3  | 2312.8  | 2475.7  | 2475.7  |
| 82.5° | 792.3   | 836.8   | 784.9   | 757.8   | 794.8   | 1076.2  | 1639.0  | 1846.3  | 2043.8  | 1755.0  | 1639.0  |
| 85°   | 323.3   | 436.9   | 476.4   | 473.9   | 496.1   | 745.4   | 1414.3  | 1579.7  | 1318.1  | 1251.4  | 1281.0  |
| 87.5° | 108.6   | 185.1   | 232.0   | 199.9   | 209.8   | 469.0   | 979.9   | 762.7   | 905.9   | 631.9   | 599.8   |
| 90°   | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |

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

Report Prepared for

Cooper Lighting Solutions

McGRAW-EDISON

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

Test Date: 10/23/2019

Luminaire Tested: SA1C-760-U-5WQ

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

### Test Information

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

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

### Spectral Parameters

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



### Test Conditions

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

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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            |

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CIE 1931 Chromaticity Diagram



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



Point lies inside the ANSI 5700K 4-step quadrangle

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**Photopic Flux vs. Wavelength**



#####

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

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**Scotopic Flux vs. Wavelength**



**Scotopic Lumens: 13759.3**

**S/P: 1.85**

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

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**Melanopic Flux vs. Wavelength**



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

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

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### Summary

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



### Color Vector Graphics



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

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



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Color Rendition by Hue-Angle Bin



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**Measure Comparisons**



(END OF REPORT)