

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: P322971

Luminaire Tested: **GLEON-SA7C-760-U-T4W-HSS**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P322971  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-19)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA7C-760-U-T4W-HSS  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(7) 70 CRI, 5700K, 1050mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE IV WIDE OPTICS WITH HOUSE SIDE SHIELD  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 36261 lumens  
Efficiency: N/A  
Efficacy: 92.7 lumens/watt  
Luminous Opening: Rectangular (W 2' x L: 1' x H: 0')  
IES Classification: Type IV - Short  
BUG Rating: B2 - U0 - G5

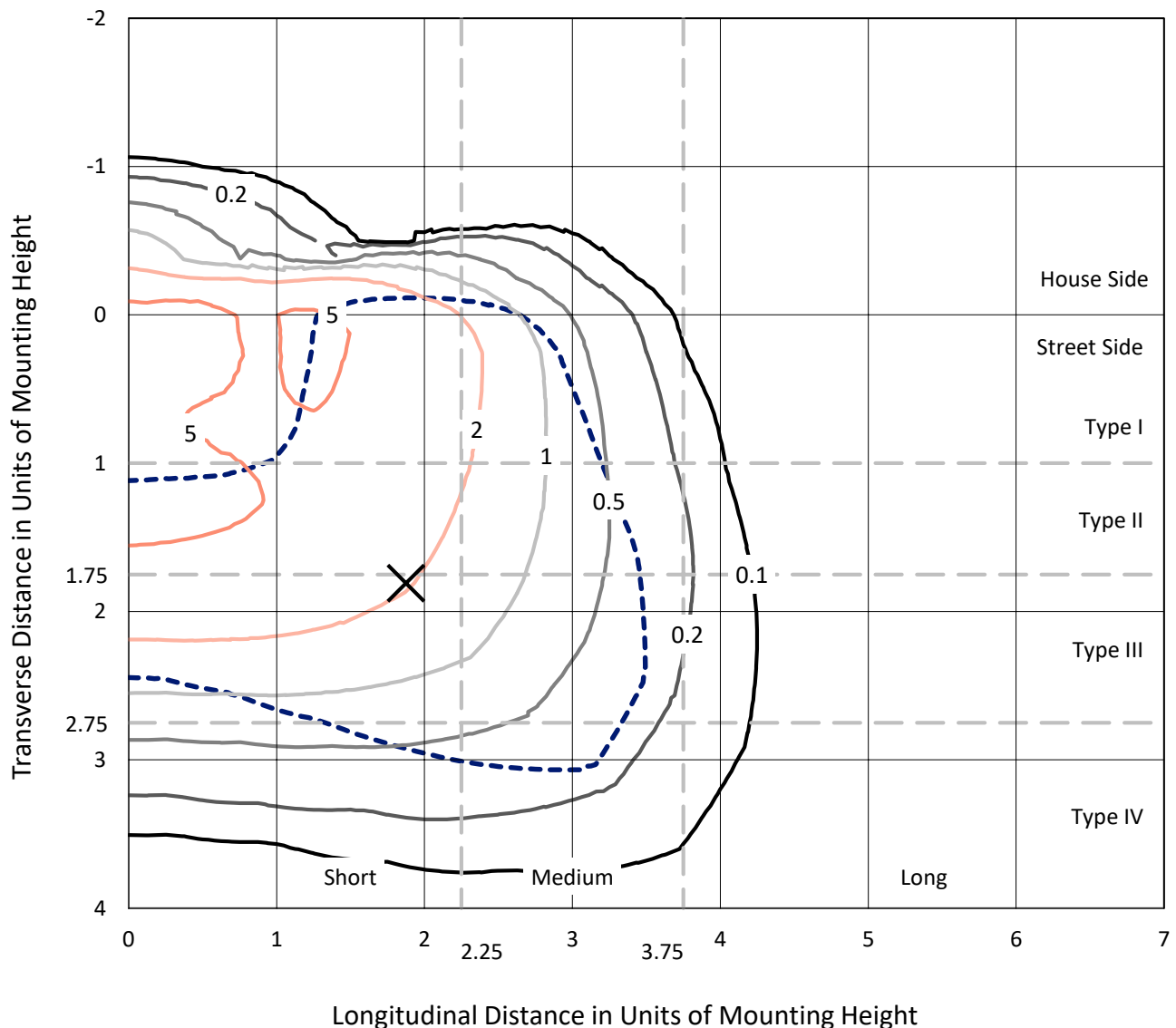
Input Watts (W): 391  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



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## Iso-Footcandle Lines of Horizontal Illumination

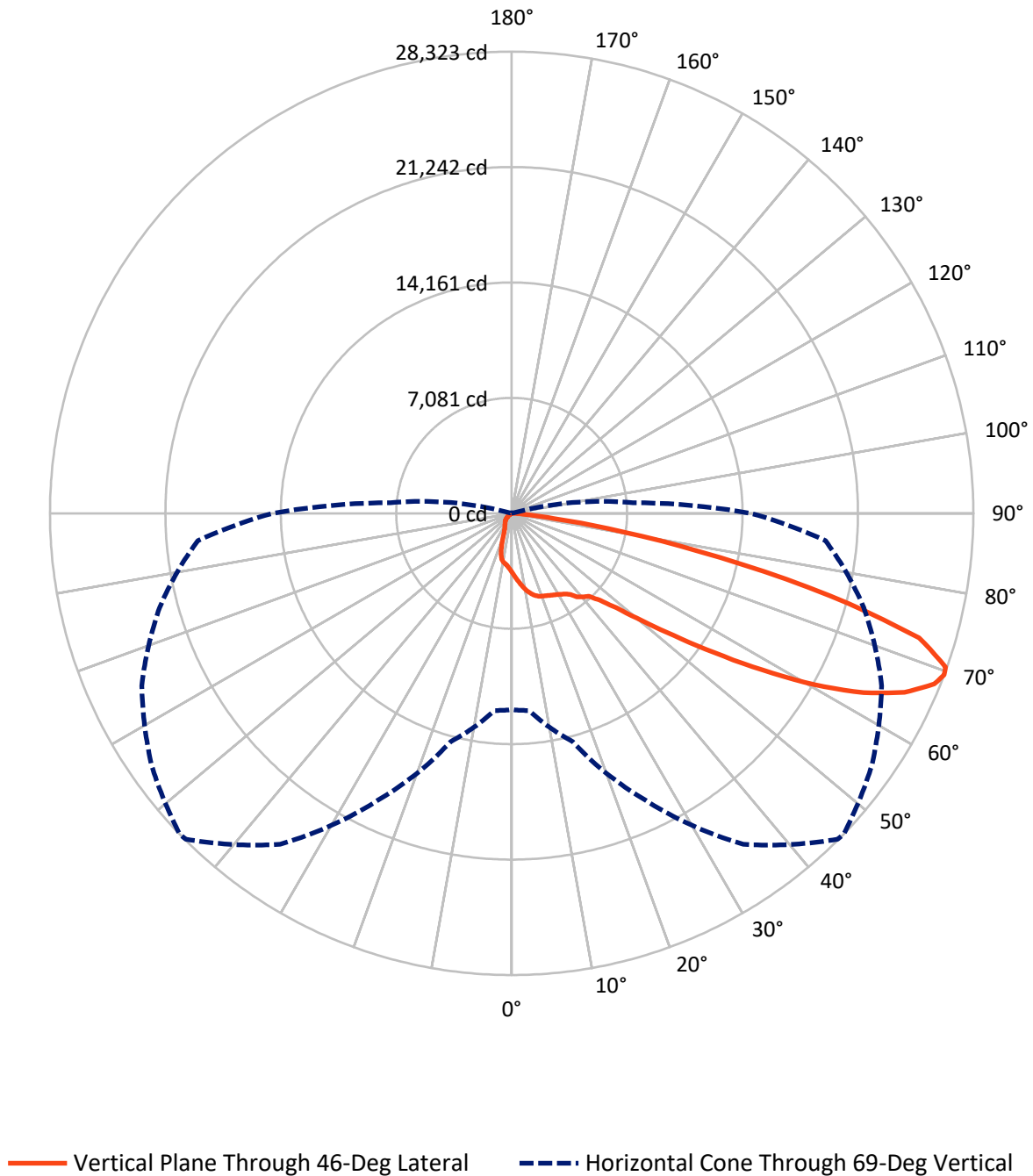
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 8.5 fc  
 Type IV - 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    | 3721.3   | 0.0    | 3721.3  |
|                    | % Fixture | 10.3     | 0.0    | 10.3    |
| <b>Street Side</b> | Lumens    | 32539.7  | 0.0    | 32539.7 |
|                    | % Fixture | 89.7     | 0.0    | 89.7    |
| <b>Total</b>       | Lumens    | 36261.0  | 0.0    | 36261.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 361.6   | 1.0       |
| 10°-20°   | 1097.1  | 3.0       |
| 20°-30°   | 1725.4  | 4.8       |
| 30°-40°   | 2474.2  | 6.8       |
| 40°-50°   | 4276.3  | 11.8      |
| 50°-60°   | 8448.3  | 23.3      |
| 60°-70°   | 11807.3 | 32.6      |
| 70°-80°   | 5704.2  | 15.7      |
| 80°-90°   | 366.6   | 1.0       |
| 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°    | 36261.0 | 100.0     |
| 0°-180°   | 36261.0 | 100.0     |

**Coefficient of Utilization**



REPORT NUMBER: P322971

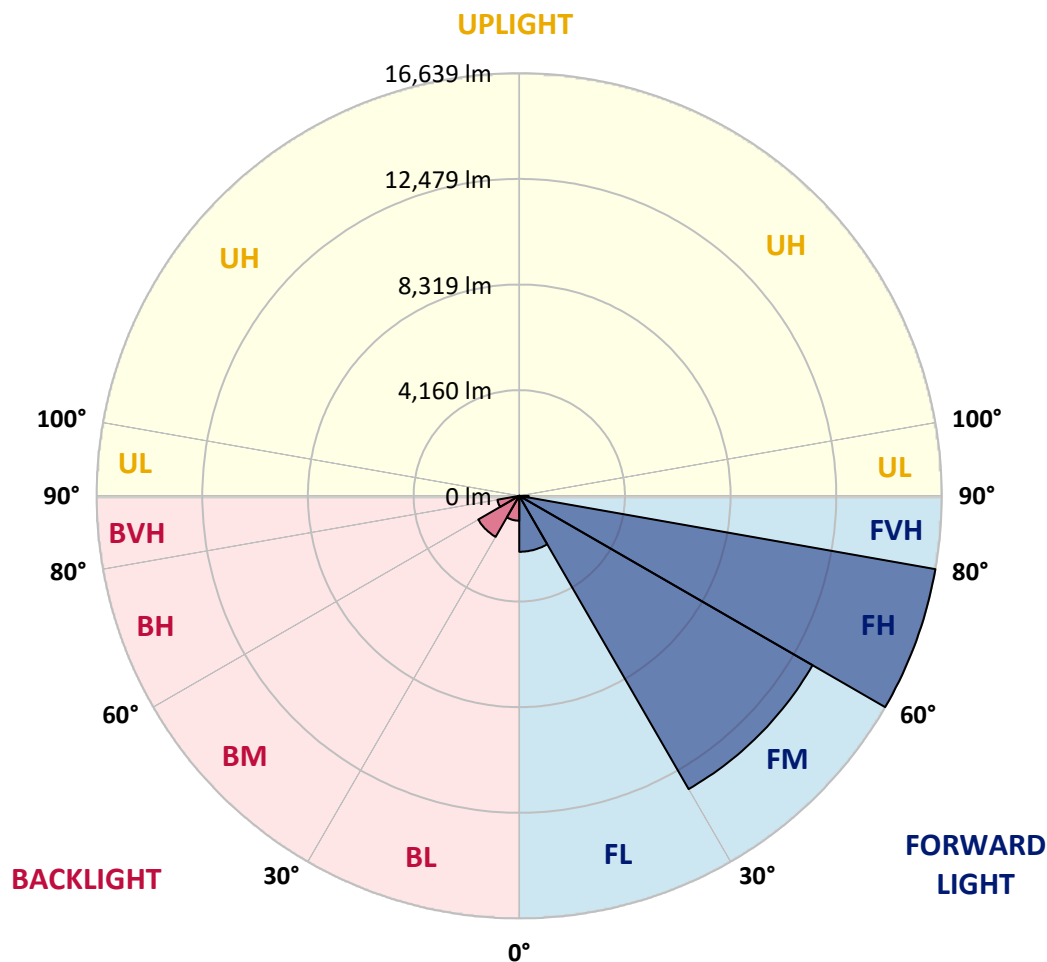
CATALOG NUMBER: GLEON-SA7C-760-U-T4W-HSS

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

| Zone |             | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|---------|-----------|-------------------------|------|---------|
|      |             |         |           | B                       | U    | G       |
| FL   | (0°-30°)    | 2203.3  | 6.1       |                         |      |         |
| FM   | (30°-60°)   | 13334.0 | 36.8      |                         |      |         |
| FH   | (60°-80°)   | 16638.8 | 45.9      |                         |      | G5      |
| FVH  | (80°-90°)   | 363.5   | 1.0       |                         |      | G3/500  |
| BL   | (0°-30°)    | 980.8   | 2.7       | B2/1000                 |      |         |
| BM   | (30°-60°)   | 1864.9  | 5.1       | B2/2500                 |      |         |
| BH   | (60°-80°)   | 872.6   | 2.4       | B2/1000                 |      | G2/1000 |
| BVH  | (80°-90°)   | 3.1     | 0.0       |                         |      | G0/10   |
| UL   | (90°-100°)  | 0.0     | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0     | 0.0       |                         | U0/0 |         |

**BUG Rating: B2-U0-G5**

Type IV Short





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 45°     | 46°     | 55°     | 65°     | 75°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 3633.2  | 3633.2  | 3633.2  | 3633.2  | 3633.2  | 3633.2  | 3633.2  | 3633.2  | 3633.2  | 3633.2  | 3633.2  |
| 2.5°  | 4036.2  | 4031.1  | 4007.2  | 3997.0  | 3939.2  | 3905.2  | 3891.6  | 3849.1  | 3787.9  | 3726.7  | 3658.7  |
| 5°    | 4495.2  | 4493.5  | 4449.3  | 4406.8  | 4298.0  | 4196.0  | 4177.3  | 4078.7  | 3940.9  | 3811.7  | 3682.5  |
| 7.5°  | 4964.4  | 4942.3  | 4898.1  | 4816.5  | 4658.4  | 4495.2  | 4479.9  | 4340.5  | 4145.0  | 3957.9  | 3772.6  |
| 10°   | 5362.3  | 5348.7  | 5290.9  | 5166.8  | 4981.4  | 4796.1  | 4777.4  | 4605.7  | 4384.7  | 4155.2  | 3918.8  |
| 12.5° | 5671.7  | 5661.5  | 5585.0  | 5430.3  | 5233.1  | 5040.9  | 5015.4  | 4862.4  | 4626.1  | 4369.4  | 4090.6  |
| 15°   | 5860.4  | 5855.3  | 5761.8  | 5596.9  | 5403.1  | 5236.5  | 5214.4  | 5080.0  | 4860.7  | 4592.1  | 4277.6  |
| 17.5° | 5904.6  | 5906.3  | 5809.4  | 5642.8  | 5483.0  | 5364.0  | 5347.0  | 5245.0  | 5061.3  | 4794.4  | 4464.6  |
| 20°   | 5806.0  | 5826.4  | 5739.7  | 5595.2  | 5496.6  | 5433.7  | 5420.1  | 5358.9  | 5204.2  | 4952.5  | 4614.2  |
| 22.5° | 5666.6  | 5676.8  | 5617.3  | 5520.4  | 5479.6  | 5491.5  | 5484.7  | 5450.7  | 5319.8  | 5088.5  | 4762.1  |
| 25°   | 5581.6  | 5581.6  | 5545.9  | 5464.3  | 5491.5  | 5564.6  | 5566.3  | 5559.5  | 5455.8  | 5255.2  | 4942.3  |
| 27.5° | 5578.2  | 5568.0  | 5527.2  | 5466.0  | 5540.8  | 5653.0  | 5659.8  | 5705.7  | 5641.1  | 5457.5  | 5166.8  |
| 30°   | 5714.2  | 5702.3  | 5615.6  | 5535.7  | 5630.9  | 5751.6  | 5768.6  | 5868.9  | 5836.6  | 5676.8  | 5416.7  |
| 32.5° | 6032.1  | 5989.6  | 5797.5  | 5666.6  | 5738.0  | 5882.5  | 5904.6  | 6064.4  | 6115.4  | 5947.1  | 5658.1  |
| 35°   | 6467.4  | 6333.1  | 6055.9  | 5914.8  | 5921.6  | 6072.9  | 6093.3  | 6328.0  | 6479.3  | 6195.3  | 5845.1  |
| 37.5° | 7067.5  | 7001.2  | 6550.7  | 6173.2  | 6203.8  | 6433.4  | 6492.9  | 6747.9  | 6705.4  | 6331.4  | 6057.6  |
| 40°   | 8383.4  | 8279.7  | 7800.3  | 6897.5  | 6474.2  | 6725.8  | 6744.5  | 6880.5  | 6883.9  | 6639.1  | 6499.7  |
| 42.5° | 10175.4 | 10132.9 | 9627.9  | 8211.7  | 7006.3  | 6921.3  | 6955.3  | 7184.8  | 7441.5  | 7288.5  | 7281.7  |
| 45°   | 12159.5 | 12137.4 | 11601.8 | 9956.1  | 8082.5  | 7562.3  | 7604.8  | 7912.5  | 8403.8  | 8437.8  | 8653.8  |
| 47.5° | 13755.9 | 13745.7 | 13438.0 | 11902.7 | 9729.9  | 8648.7  | 8662.3  | 8988.7  | 9852.4  | 10279.1 | 10624.2 |
| 50°   | 15211.2 | 15260.5 | 15017.4 | 14009.2 | 11974.1 | 10350.5 | 10318.2 | 10535.8 | 11923.1 | 12621.9 | 13050.3 |
| 52.5° | 17234.4 | 17304.1 | 16622.3 | 15974.6 | 14328.8 | 12462.1 | 12436.6 | 12664.4 | 14412.2 | 14935.8 | 15012.3 |
| 55°   | 19021.3 | 18902.2 | 18363.3 | 18176.3 | 17200.4 | 15070.1 | 15063.3 | 15263.9 | 16819.6 | 17042.3 | 17183.4 |
| 57.5° | 19810.1 | 19764.2 | 20024.3 | 20452.8 | 20208.0 | 18152.5 | 18137.2 | 17984.2 | 18973.7 | 18997.5 | 19431.0 |
| 60°   | 20308.3 | 20364.4 | 21161.7 | 22482.8 | 23093.1 | 21469.5 | 21370.9 | 20437.5 | 21030.8 | 20978.1 | 21442.3 |
| 62.5° | 19934.2 | 20044.7 | 21479.7 | 23681.4 | 25252.3 | 24364.8 | 24225.4 | 22685.1 | 22788.8 | 22606.9 | 23038.7 |
| 65°   | 17948.5 | 18120.2 | 20471.5 | 23455.2 | 26323.4 | 26627.7 | 26486.6 | 24669.2 | 24184.6 | 23885.4 | 23645.7 |
| 67.5° | 14573.7 | 14675.7 | 17130.7 | 21488.2 | 25840.6 | 27977.6 | 27948.7 | 26408.4 | 25238.7 | 23669.5 | 21809.5 |
| 69°   | 12043.8 | 12144.2 | 14507.4 | 19417.4 | 24778.0 | 28266.7 | 28322.8 | 26966.1 | 25038.1 | 22356.9 | 19323.9 |
| 70°   | 10200.9 | 10308.0 | 12509.7 | 17642.4 | 23545.4 | 28132.4 | 28232.7 | 26913.3 | 24463.4 | 20837.0 | 17142.6 |
| 72.5° | 5350.4  | 5442.2  | 7701.7  | 12154.4 | 19194.7 | 25832.1 | 26136.4 | 24638.5 | 20736.7 | 15133.0 | 10136.3 |
| 75°   | 1681.4  | 1734.2  | 3007.6  | 6353.5  | 13142.1 | 20085.6 | 20155.3 | 19327.3 | 14725.0 | 8323.9  | 4221.5  |
| 77.5° | 641.0   | 625.7   | 1001.4  | 2341.1  | 6644.2  | 12647.4 | 13074.1 | 12077.9 | 7727.2  | 2943.0  | 974.2   |
| 80°   | 345.1   | 346.8   | 520.2   | 969.1   | 2842.6  | 6499.7  | 6860.1  | 5853.6  | 2745.7  | 918.1   | 224.4   |
| 82.5° | 149.6   | 156.4   | 292.4   | 513.4   | 1305.7  | 2397.2  | 2577.4  | 2145.6  | 1049.0  | 617.2   | 83.3    |
| 85°   | 32.3    | 35.7    | 141.1   | 278.8   | 532.1   | 673.3   | 705.6   | 695.4   | 668.2   | 479.4   | 32.3    |
| 87.5° | 0.0     | 0.0     | 62.9    | 100.3   | 134.3   | 153.0   | 134.3   | 175.1   | 368.9   | 323.0   | 17.0    |
| 90°   | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |



REPORT NUMBER: P322971

CATALOG NUMBER: GLEON-SA7C-760-U-T4W-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°     | 95°     | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|---------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 3633.2  | 3633.2  | 3633.2 | 3633.2 | 3633.2 | 3633.2 | 3633.2 | 3633.2 | 3633.2 | 3633.2 | 3633.2 |
| 2.5°  | 3636.6  | 3606.0  | 3553.3 | 3495.5 | 3454.7 | 3412.2 | 3378.2 | 3362.9 | 3345.9 | 3334.0 | 3349.3 |
| 5°    | 3629.8  | 3570.3  | 3468.3 | 3369.7 | 3298.3 | 3240.5 | 3192.9 | 3174.2 | 3155.5 | 3141.9 | 3140.2 |
| 7.5°  | 3689.3  | 3606.0  | 3449.6 | 3305.1 | 3194.6 | 3116.4 | 3051.8 | 3024.6 | 3002.5 | 2992.3 | 2983.8 |
| 10°   | 3803.2  | 3696.1  | 3487.0 | 3298.3 | 3155.5 | 3022.9 | 2883.5 | 2776.3 | 2706.6 | 2674.3 | 2662.4 |
| 12.5° | 3951.1  | 3816.8  | 3558.4 | 3334.0 | 3126.6 | 2871.6 | 2575.7 | 2320.7 | 2155.8 | 2101.4 | 2069.1 |
| 15°   | 4124.6  | 3957.9  | 3651.9 | 3379.9 | 3021.2 | 2555.3 | 2053.8 | 1720.5 | 1567.5 | 1536.9 | 1502.9 |
| 17.5° | 4291.2  | 4107.6  | 3764.1 | 3388.4 | 2789.9 | 2041.9 | 1504.6 | 1278.5 | 1219.0 | 1239.4 | 1244.5 |
| 20°   | 4437.4  | 4255.5  | 3874.6 | 3313.6 | 2370.0 | 1531.8 | 1164.6 | 1108.5 | 1130.6 | 1169.7 | 1176.5 |
| 22.5° | 4585.3  | 4398.3  | 3976.6 | 3116.4 | 1832.8 | 1162.9 | 1049.0 | 1062.6 | 1084.7 | 1123.8 | 1130.6 |
| 25°   | 4765.5  | 4571.7  | 4071.9 | 2754.2 | 1375.4 | 989.5  | 996.3  | 1016.7 | 1038.8 | 1074.5 | 1077.9 |
| 27.5° | 4972.9  | 4791.0  | 4134.8 | 2283.3 | 1020.1 | 909.6  | 931.7  | 962.3  | 984.4  | 1018.4 | 1025.2 |
| 30°   | 5248.4  | 5080.0  | 4155.2 | 1795.4 | 855.2  | 838.2  | 848.4  | 885.8  | 918.1  | 948.7  | 953.8  |
| 32.5° | 5506.8  | 5365.7  | 4087.2 | 1355.0 | 792.3  | 771.9  | 771.9  | 794.0  | 831.4  | 860.3  | 867.1  |
| 35°   | 5744.8  | 5653.0  | 3869.5 | 991.2  | 744.7  | 710.7  | 693.7  | 693.7  | 717.5  | 741.3  | 748.1  |
| 37.5° | 6059.3  | 6055.9  | 3517.6 | 790.6  | 698.8  | 659.7  | 624.0  | 596.8  | 588.3  | 593.4  | 596.8  |
| 40°   | 6598.3  | 6603.4  | 3058.6 | 709.0  | 659.7  | 607.0  | 552.5  | 503.2  | 457.3  | 442.0  | 440.3  |
| 42.5° | 7439.8  | 7363.3  | 2577.4 | 669.9  | 625.7  | 552.5  | 470.9  | 404.6  | 333.2  | 311.1  | 309.4  |
| 45°   | 8776.2  | 8322.2  | 2067.4 | 634.2  | 590.0  | 491.3  | 389.3  | 299.2  | 241.4  | 224.4  | 224.4  |
| 47.5° | 10722.8 | 9582.0  | 1601.5 | 595.1  | 542.3  | 421.6  | 294.1  | 215.9  | 176.8  | 168.3  | 170.0  |
| 50°   | 12735.8 | 10816.3 | 1227.5 | 545.7  | 484.5  | 348.5  | 217.6  | 156.4  | 134.3  | 134.3  | 136.0  |
| 52.5° | 14521.0 | 11720.8 | 957.2  | 493.0  | 413.1  | 273.7  | 164.9  | 122.4  | 112.2  | 110.5  | 112.2  |
| 55°   | 16192.2 | 12304.0 | 732.8  | 431.8  | 328.1  | 204.0  | 125.8  | 100.3  | 93.5   | 90.1   | 88.4   |
| 57.5° | 17804.0 | 12593.0 | 549.1  | 348.5  | 238.0  | 147.9  | 100.3  | 85.0   | 78.2   | 73.1   | 71.4   |
| 60°   | 18876.7 | 12358.4 | 377.4  | 256.7  | 164.9  | 107.1  | 83.3   | 73.1   | 64.6   | 59.5   | 57.8   |
| 62.5° | 19482.0 | 11717.4 | 243.1  | 185.3  | 117.3  | 79.9   | 66.3   | 61.2   | 49.3   | 44.2   | 44.2   |
| 65°   | 19237.2 | 10659.9 | 170.0  | 132.6  | 85.0   | 59.5   | 49.3   | 49.3   | 35.7   | 28.9   | 27.2   |
| 67.5° | 17047.4 | 9005.7  | 129.2  | 98.6   | 61.2   | 44.2   | 37.4   | 42.5   | 22.1   | 13.6   | 13.6   |
| 69°   | 14667.2 | 7463.7  | 110.5  | 81.6   | 51.0   | 35.7   | 32.3   | 39.1   | 15.3   | 10.2   | 8.5    |
| 70°   | 12747.7 | 6438.5  | 100.3  | 71.4   | 42.5   | 30.6   | 28.9   | 37.4   | 15.3   | 8.5    | 6.8    |
| 72.5° | 7626.9  | 3590.7  | 76.5   | 51.0   | 27.2   | 23.8   | 23.8   | 42.5   | 15.3   | 8.5    | 6.8    |
| 75°   | 3082.4  | 1264.9  | 56.1   | 35.7   | 20.4   | 20.4   | 28.9   | 54.4   | 13.6   | 6.8    | 5.1    |
| 77.5° | 698.8   | 277.1   | 32.3   | 22.1   | 13.6   | 20.4   | 34.0   | 42.5   | 8.5    | 3.4    | 0.0    |
| 80°   | 170.0   | 68.0    | 20.4   | 13.6   | 8.5    | 15.3   | 25.5   | 23.8   | 1.7    | 0.0    | 0.0    |
| 82.5° | 56.1    | 23.8    | 8.5    | 6.8    | 1.7    | 5.1    | 11.9   | 6.8    | 0.0    | 0.0    | 0.0    |
| 85°   | 23.8    | 13.6    | 3.4    | 1.7    | 0.0    | 0.0    | 1.7    | 0.0    | 0.0    | 0.0    | 0.0    |
| 87.5° | 15.3    | 5.1     | 0.0    | 0.0    | 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

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

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**



#####

| 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               |           |                  |                  |

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

**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               |           |                  |                  |

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

**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               |           |                  |                  |

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

**TM-30-18**

**Summary**

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



**Color Vector Graphics**



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

**TM-30-18**

**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 |            |



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

**TM-30-18**

Color Rendition by Hue-Angle Bin



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

**TM-30-18**

**Measure Comparisons**



(END OF REPORT)