

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: P321352

Luminaire Tested: **GLEON-SA8A-760-U-T2R-HSS**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P321352  
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-SA8A-760-U-T2R-HSS  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(8) 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: 30146 lumens  
Efficiency: N/A  
Efficacy: 117.3 lumens/watt  
Luminous Opening: Rectangular (W 2' x L: 1' x H: 0')  
IES Classification: Type II - Medium  
BUG Rating: B2 - U0 - G4

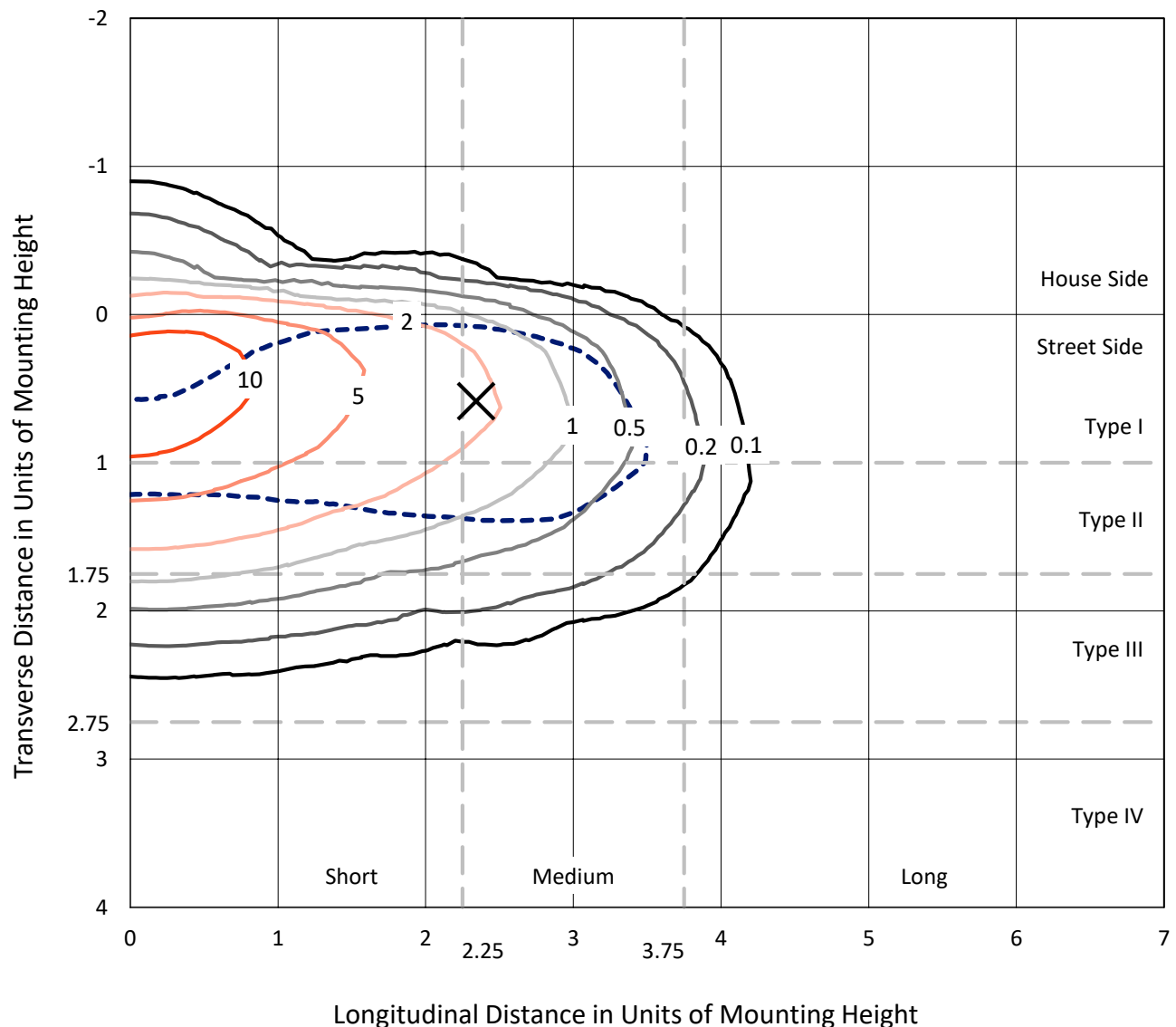
Input Watts (W): 257  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



REPORT NUMBER: P321352  
 CATALOG NUMBER: GLEON-SA8A-760-U-T2R-HSS

## Iso-Footcandle Lines of Horizontal Illumination

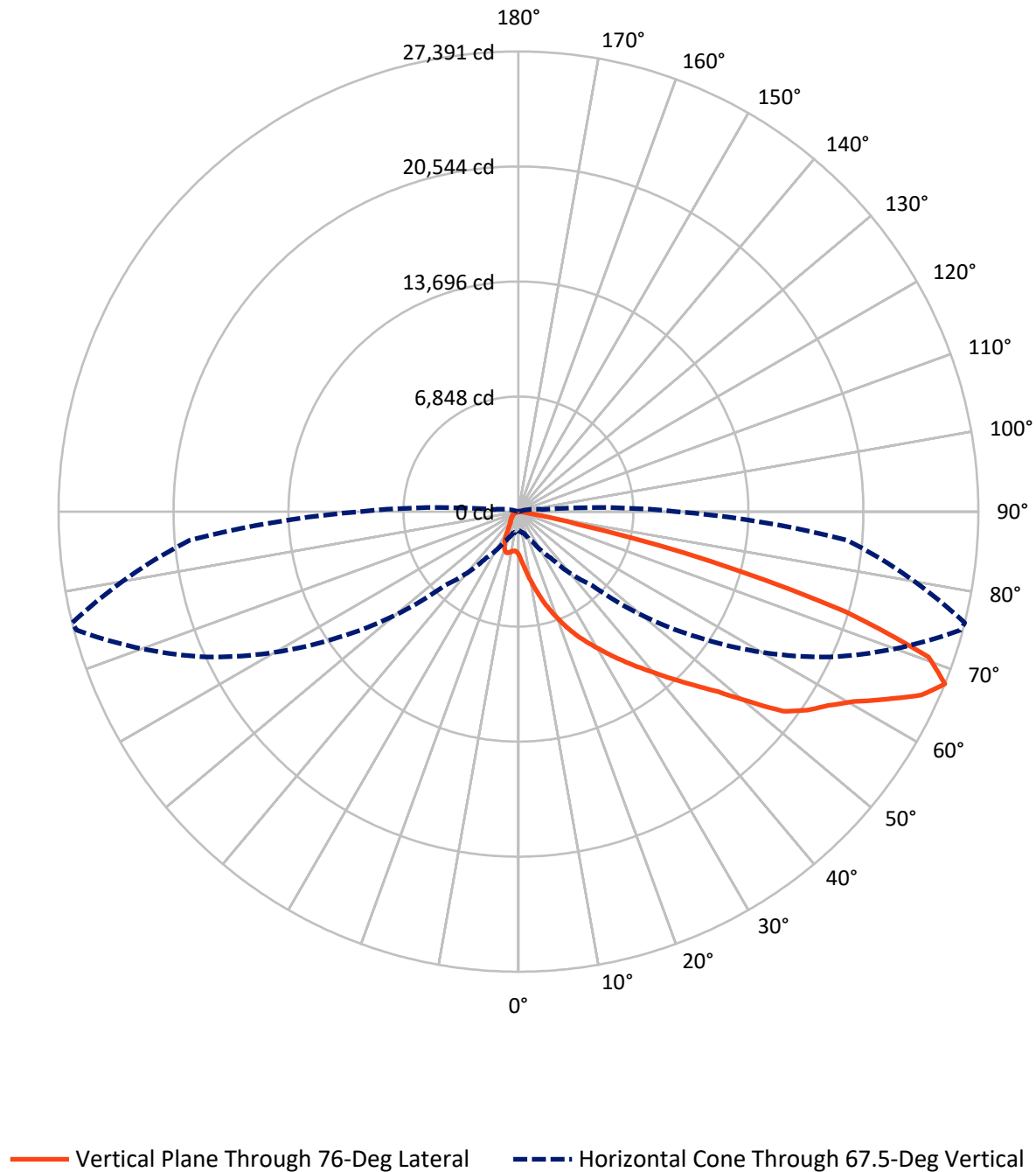
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 14.4 fc  
 Type II - Medium - N/A

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## Luminous Intensity Polar Plot



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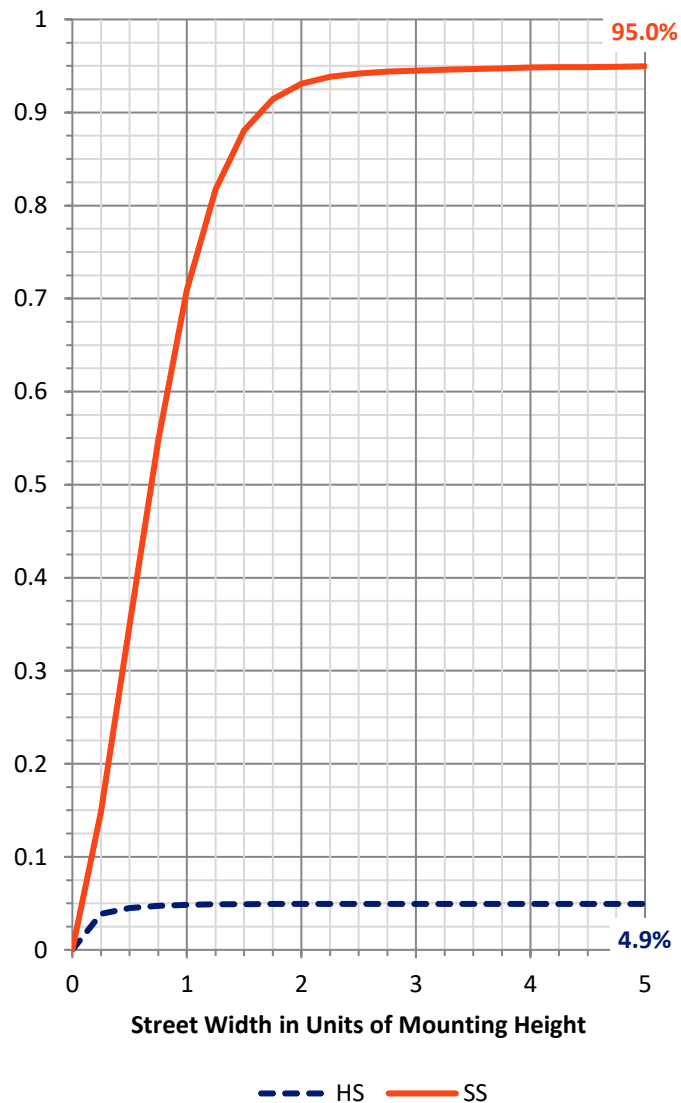
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 1497.0   | 0.0    | 1497.0  |
|                    | % Fixture | 5.0      | 0.0    | 5.0     |
| <b>Street Side</b> | Lumens    | 28649.0  | 0.0    | 28649.0 |
|                    | % Fixture | 95.0     | 0.0    | 95.0    |
| <b>Total</b>       | Lumens    | 30146.0  | 0.0    | 30146.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 318.0   | 1.1       |
| 10°-20°   | 1260.6  | 4.2       |
| 20°-30°   | 2564.8  | 8.5       |
| 30°-40°   | 4451.7  | 14.8      |
| 40°-50°   | 6289.7  | 20.9      |
| 50°-60°   | 7132.8  | 23.7      |
| 60°-70°   | 5916.0  | 19.6      |
| 70°-80°   | 2142.9  | 7.1       |
| 80°-90°   | 69.5    | 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°    | 30146.0 | 100.0     |
| 0°-180°   | 30146.0 | 100.0     |

**Coefficient of Utilization**



REPORT NUMBER: P321352

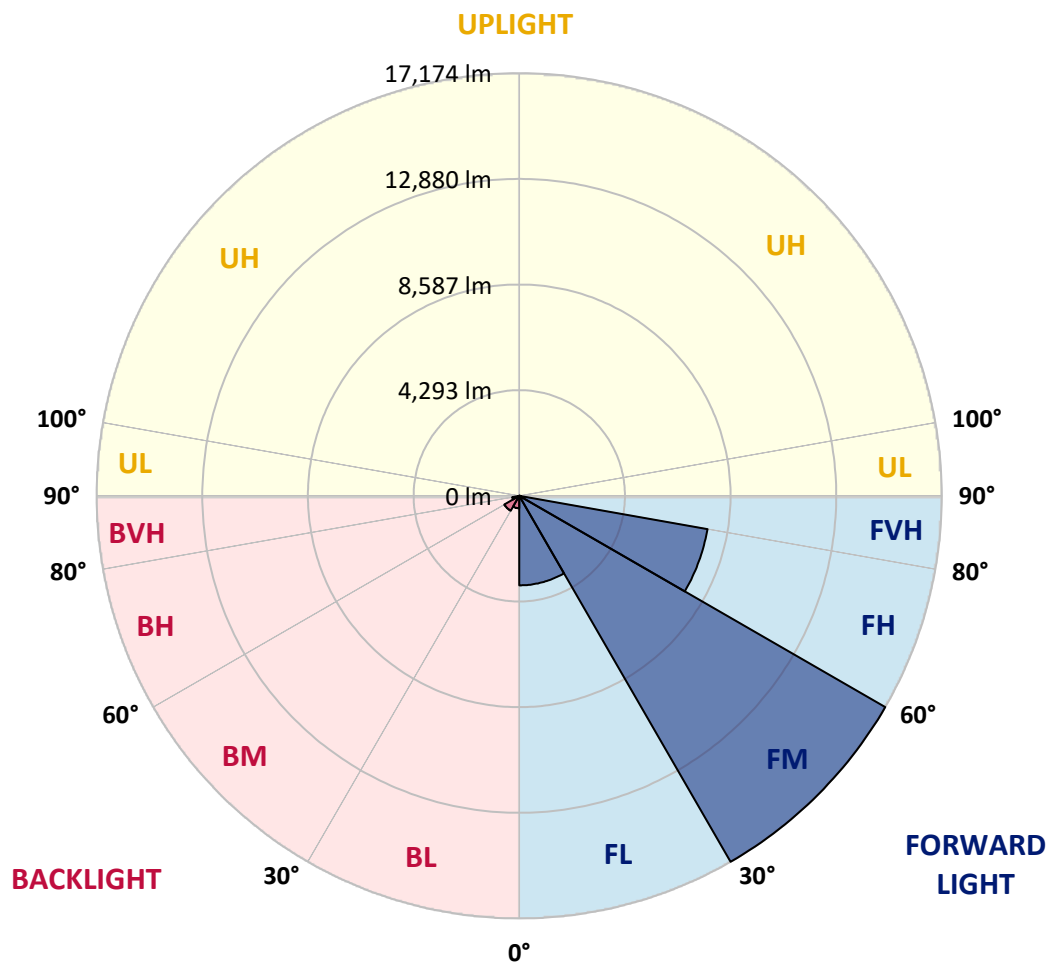
CATALOG NUMBER: GLEON-SA8A-760-U-T2R-HSS

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

| Zone |             | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |          |
|------|-------------|---------|-----------|-------------------------|------|----------|
|      |             |         |           | B                       | U    | G        |
| FL   | (0°-30°)    | 3638.5  | 12.1      |                         |      |          |
| FM   | (30°-60°)   | 17173.6 | 57.0      |                         |      |          |
| FH   | (60°-80°)   | 7769.6  | 25.8      |                         |      | G4/12000 |
| FVH  | (80°-90°)   | 67.3    | 0.2       |                         |      | G1/100   |
| BL   | (0°-30°)    | 504.9   | 1.7       | B2/1000                 |      |          |
| BM   | (30°-60°)   | 700.6   | 2.3       | B1/1000                 |      |          |
| BH   | (60°-80°)   | 289.3   | 1.0       | B1/500                  |      | G1/500   |
| BVH  | (80°-90°)   | 2.2     | 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-G4**

Type II Medium



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 45°     | 55°     | 65°     | 75°     | 76°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 2557.3  | 2557.3  | 2557.3  | 2557.3  | 2557.3  | 2557.3  | 2557.3  | 2557.3  | 2557.3  | 2557.3  | 2557.3  |
| 2.5°  | 3817.4  | 3731.5  | 3751.3  | 3695.9  | 3595.5  | 3389.4  | 3213.7  | 3047.3  | 2853.1  | 2846.5  | 2686.7  |
| 5°    | 5147.5  | 5074.9  | 5065.6  | 4953.4  | 4771.1  | 4421.0  | 4080.2  | 3691.9  | 3258.6  | 3226.9  | 2887.5  |
| 7.5°  | 6354.8  | 6296.7  | 6275.6  | 6142.2  | 5802.7  | 5461.9  | 5018.1  | 4447.5  | 3769.8  | 3711.7  | 3158.3  |
| 10°   | 7282.1  | 7254.4  | 7259.6  | 7164.5  | 6873.9  | 6556.9  | 5974.4  | 5246.6  | 4349.7  | 4259.9  | 3483.2  |
| 12.5° | 7984.8  | 7991.4  | 8039.0  | 7980.9  | 7818.4  | 7583.3  | 6961.1  | 6098.6  | 4991.7  | 4868.8  | 3854.4  |
| 15°   | 8501.3  | 8534.3  | 8621.5  | 8694.1  | 8682.2  | 8478.8  | 7908.2  | 6963.8  | 5673.2  | 5537.2  | 4267.8  |
| 17.5° | 8835.5  | 8872.5  | 8999.3  | 9160.4  | 9308.4  | 9260.8  | 8822.3  | 7798.6  | 6362.8  | 6205.6  | 4710.3  |
| 20°   | 9128.7  | 9172.3  | 9308.4  | 9521.0  | 9797.1  | 9856.5  | 9568.6  | 8608.3  | 7050.9  | 6859.4  | 5167.3  |
| 22.5° | 9764.1  | 9762.7  | 9846.0  | 9970.1  | 10233.0 | 10386.2 | 10203.9 | 9359.9  | 7731.2  | 7531.7  | 5633.6  |
| 25°   | 10913.2 | 10869.6 | 10840.6 | 10742.8 | 10801.0 | 10896.1 | 10794.4 | 10062.6 | 8415.4  | 8213.3  | 6106.5  |
| 27.5° | 12279.0 | 12305.5 | 12070.3 | 11807.5 | 11604.1 | 11506.3 | 11339.9 | 10713.8 | 9073.2  | 8851.3  | 6568.8  |
| 30°   | 13720.1 | 13728.1 | 13450.7 | 13115.2 | 12667.4 | 12296.2 | 12008.3 | 11335.9 | 9749.5  | 9507.8  | 7017.9  |
| 32.5° | 15019.9 | 14968.4 | 14693.6 | 14236.6 | 13671.3 | 13253.9 | 12655.5 | 12030.7 | 10465.5 | 10231.7 | 7517.2  |
| 35°   | 16050.2 | 15989.4 | 15655.3 | 15239.2 | 14652.7 | 14232.7 | 13512.8 | 12724.2 | 11218.4 | 10989.9 | 8017.8  |
| 37.5° | 16803.1 | 16731.8 | 16388.4 | 15960.4 | 15454.5 | 15210.1 | 14507.4 | 13478.4 | 12040.0 | 11794.3 | 8544.9  |
| 40°   | 17064.7 | 17002.6 | 16787.3 | 16474.2 | 16067.4 | 16011.9 | 15562.8 | 14346.2 | 12934.2 | 12672.7 | 9141.9  |
| 42.5° | 16908.8 | 16848.0 | 16771.4 | 16665.7 | 16496.7 | 16549.5 | 16558.7 | 15335.6 | 13927.5 | 13669.9 | 9801.0  |
| 45°   | 16290.6 | 16236.4 | 16315.7 | 16470.2 | 16680.3 | 16941.8 | 17467.5 | 16398.9 | 15037.1 | 14762.3 | 10563.2 |
| 47.5° | 15380.5 | 15340.9 | 15560.2 | 15945.9 | 16560.1 | 17281.3 | 18298.4 | 17516.4 | 16282.7 | 16027.7 | 11514.2 |
| 50°   | 14086.0 | 14079.4 | 14518.0 | 15222.0 | 16166.4 | 17445.1 | 19156.9 | 18787.1 | 18013.1 | 17744.9 | 12836.5 |
| 52.5° | 12070.3 | 12083.6 | 12946.1 | 14072.8 | 15475.6 | 17334.1 | 19709.1 | 20419.7 | 20026.1 | 19747.4 | 13981.7 |
| 55°   | 10151.1 | 10230.3 | 10841.9 | 12466.6 | 14416.3 | 16922.0 | 19899.3 | 21181.9 | 21137.0 | 20872.8 | 14618.4 |
| 57.5° | 8271.4  | 8415.4  | 9004.5  | 10522.3 | 12869.5 | 15972.3 | 19794.9 | 21512.1 | 21963.9 | 21761.8 | 15458.4 |
| 60°   | 6234.6  | 6300.7  | 6979.6  | 8398.3  | 10884.2 | 14239.3 | 19038.1 | 21691.7 | 23094.5 | 22954.5 | 16677.6 |
| 62.5° | 3966.6  | 4131.8  | 4734.1  | 6102.5  | 8474.9  | 11832.6 | 17762.1 | 21689.1 | 24509.2 | 24585.8 | 18250.8 |
| 65°   | 2089.7  | 2282.5  | 2602.2  | 3781.7  | 5823.8  | 9144.6  | 15842.8 | 21485.7 | 26244.9 | 26351.9 | 19480.6 |
| 67.5° | 1126.7  | 1182.2  | 1351.3  | 1962.9  | 3377.5  | 6195.0  | 13022.7 | 20481.8 | 27250.1 | 27391.4 | 19652.3 |
| 70°   | 824.2   | 854.6   | 918.0   | 1085.8  | 1700.0  | 3598.1  | 9502.5  | 18205.9 | 25954.3 | 25901.4 | 17460.9 |
| 72.5° | 632.7   | 680.3   | 727.8   | 795.2   | 977.5   | 1920.6  | 5916.3  | 14256.4 | 20709.0 | 20360.3 | 13051.8 |
| 75°   | 499.3   | 507.2   | 574.6   | 635.4   | 733.1   | 1093.7  | 2627.3  | 8303.1  | 12639.7 | 11814.1 | 6768.3  |
| 77.5° | 398.9   | 404.2   | 443.8   | 496.7   | 589.1   | 718.6   | 813.7   | 3266.6  | 4035.3  | 3600.8  | 1468.8  |
| 80°   | 236.4   | 249.6   | 330.2   | 383.1   | 488.7   | 453.1   | 297.2   | 709.3   | 630.1   | 570.6   | 247.0   |
| 82.5° | 132.1   | 142.7   | 186.2   | 302.5   | 340.8   | 216.6   | 147.9   | 191.5   | 147.9   | 144.0   | 70.0    |
| 85°   | 0.0     | 6.6     | 120.2   | 187.6   | 138.7   | 47.6    | 62.1    | 63.4    | 43.6    | 40.9    | 27.7    |
| 87.5° | 0.0     | 0.0     | 37.0    | 35.7    | 5.3     | 7.9     | 14.5    | 21.1    | 17.2    | 17.2    | 14.5    |
| 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: P321352

CATALOG NUMBER: GLEON-SA8A-760-U-T2R-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°     | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 2557.3  | 2557.3 | 2557.3 | 2557.3 | 2557.3 | 2557.3 | 2557.3 | 2557.3 | 2557.3 | 2557.3 | 2557.3 |
| 2.5°  | 2607.4  | 2536.1 | 2401.4 | 2269.3 | 2158.3 | 2067.2 | 1985.3 | 1952.3 | 1925.9 | 1921.9 | 1900.8 |
| 5°    | 2723.7  | 2579.7 | 2322.1 | 2110.8 | 1969.5 | 1869.1 | 1783.2 | 1730.4 | 1689.4 | 1673.6 | 1659.0 |
| 7.5°  | 2899.4  | 2681.4 | 2311.6 | 2068.5 | 1899.4 | 1730.4 | 1571.9 | 1400.1 | 1293.2 | 1252.2 | 1228.4 |
| 10°   | 3113.4  | 2816.1 | 2351.2 | 2056.6 | 1760.8 | 1404.1 | 1141.3 | 923.3  | 834.8  | 805.7  | 797.8  |
| 12.5° | 3363.0  | 2983.9 | 2419.9 | 1982.7 | 1464.9 | 997.3  | 787.3  | 713.3  | 693.5  | 684.2  | 684.2  |
| 15°   | 3649.6  | 3167.5 | 2468.8 | 1768.7 | 1083.1 | 754.2  | 681.6  | 647.2  | 626.1  | 614.2  | 615.5  |
| 17.5° | 3942.9  | 3347.1 | 2445.0 | 1458.3 | 799.1  | 671.0  | 616.9  | 579.9  | 550.8  | 538.9  | 536.3  |
| 20°   | 4238.8  | 3513.6 | 2312.9 | 1085.8 | 676.3  | 608.9  | 548.2  | 507.2  | 478.2  | 466.3  | 463.6  |
| 22.5° | 4545.2  | 3654.9 | 2080.4 | 796.5  | 607.6  | 540.2  | 480.8  | 439.9  | 412.1  | 401.6  | 396.3  |
| 25°   | 4843.7  | 3769.8 | 1755.5 | 644.6  | 542.9  | 475.5  | 418.7  | 380.4  | 355.3  | 344.8  | 343.4  |
| 27.5° | 5122.4  | 3842.5 | 1379.0 | 569.3  | 486.1  | 417.4  | 365.9  | 331.5  | 310.4  | 302.5  | 301.2  |
| 30°   | 5373.4  | 3849.1 | 1019.7 | 513.8  | 435.9  | 367.2  | 319.7  | 289.3  | 270.8  | 262.9  | 260.2  |
| 32.5° | 5627.0  | 3793.6 | 742.3  | 463.6  | 389.7  | 323.6  | 277.4  | 253.6  | 240.4  | 233.8  | 233.8  |
| 35°   | 5866.1  | 3665.5 | 578.6  | 420.0  | 344.8  | 281.4  | 244.4  | 227.2  | 219.3  | 212.7  | 212.7  |
| 37.5° | 6099.9  | 3481.9 | 491.4  | 381.7  | 302.5  | 245.7  | 215.3  | 204.7  | 198.1  | 191.5  | 191.5  |
| 40°   | 6337.7  | 3250.7 | 446.5  | 346.1  | 268.1  | 217.9  | 191.5  | 182.3  | 175.7  | 170.4  | 169.1  |
| 42.5° | 6629.6  | 2983.9 | 417.4  | 313.1  | 237.8  | 192.9  | 169.1  | 158.5  | 153.2  | 147.9  | 145.3  |
| 45°   | 6967.7  | 2754.1 | 393.6  | 280.0  | 212.7  | 171.7  | 146.6  | 136.1  | 128.1  | 121.5  | 120.2  |
| 47.5° | 7455.1  | 2587.6 | 361.9  | 244.4  | 188.9  | 149.3  | 126.8  | 114.9  | 103.0  | 96.4   | 95.1   |
| 50°   | 8077.3  | 2450.3 | 321.0  | 212.7  | 165.1  | 126.8  | 105.7  | 91.1   | 80.6   | 74.0   | 74.0   |
| 52.5° | 8386.4  | 2270.6 | 284.0  | 184.9  | 138.7  | 107.0  | 85.9   | 68.7   | 63.4   | 56.8   | 56.8   |
| 55°   | 8510.5  | 2133.2 | 247.0  | 157.2  | 114.9  | 88.5   | 67.4   | 52.8   | 48.9   | 44.9   | 43.6   |
| 57.5° | 8859.2  | 2093.6 | 215.3  | 133.4  | 95.1   | 70.0   | 51.5   | 39.6   | 37.0   | 31.7   | 31.7   |
| 60°   | 9420.6  | 2113.4 | 186.2  | 113.6  | 76.6   | 54.2   | 38.3   | 30.4   | 27.7   | 22.5   | 22.5   |
| 62.5° | 10026.9 | 2088.3 | 157.2  | 97.7   | 59.4   | 39.6   | 26.4   | 22.5   | 22.5   | 13.2   | 11.9   |
| 65°   | 10143.2 | 1859.8 | 134.7  | 80.6   | 46.2   | 29.1   | 17.2   | 14.5   | 19.8   | 2.6    | 0.0    |
| 67.5° | 9414.0  | 1442.4 | 116.2  | 62.1   | 34.3   | 22.5   | 13.2   | 6.6    | 17.2   | 0.0    | 0.0    |
| 70°   | 7527.8  | 916.7  | 93.8   | 44.9   | 26.4   | 18.5   | 10.6   | 2.6    | 13.2   | 0.0    | 0.0    |
| 72.5° | 5323.2  | 532.3  | 74.0   | 31.7   | 22.5   | 14.5   | 7.9    | 0.0    | 7.9    | 0.0    | 0.0    |
| 75°   | 2692.0  | 284.0  | 46.2   | 23.8   | 17.2   | 10.6   | 5.3    | 0.0    | 1.3    | 0.0    | 0.0    |
| 77.5° | 582.5   | 132.1  | 29.1   | 17.2   | 11.9   | 6.6    | 2.6    | 0.0    | 0.0    | 0.0    | 0.0    |
| 80°   | 126.8   | 58.1   | 18.5   | 10.6   | 6.6    | 4.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 82.5° | 46.2    | 30.4   | 9.2    | 5.3    | 2.6    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 85°   | 25.1    | 15.9   | 5.3    | 2.6    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 87.5° | 13.2    | 5.3    | 1.3    | 1.3    | 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

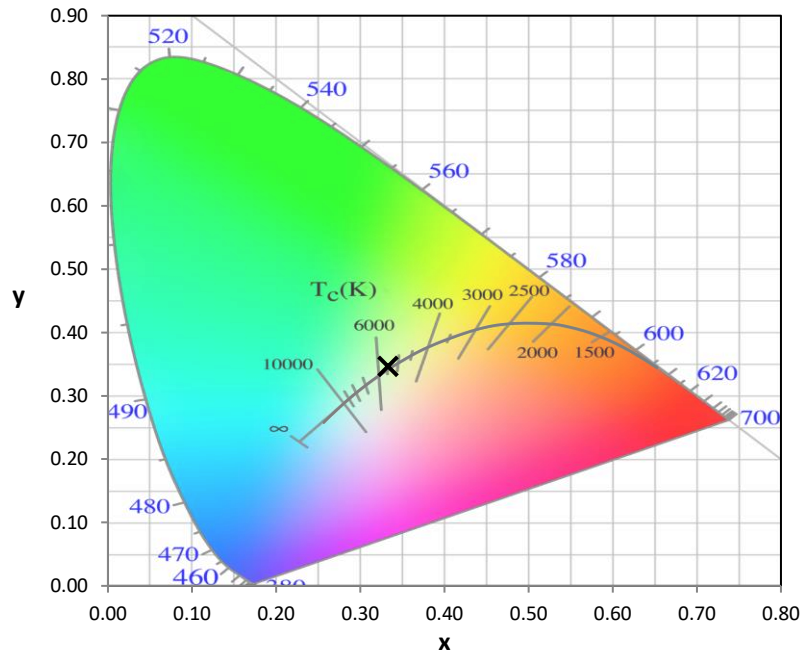
Stabilization Time: 240M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 24.6/31%  
 Sphere Temperature (°C): 25.9

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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            |

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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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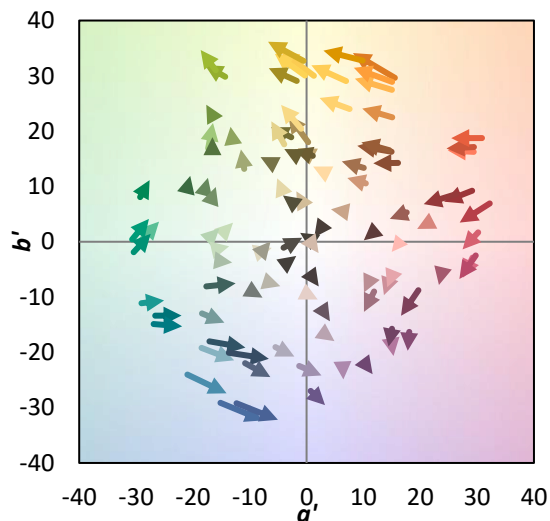
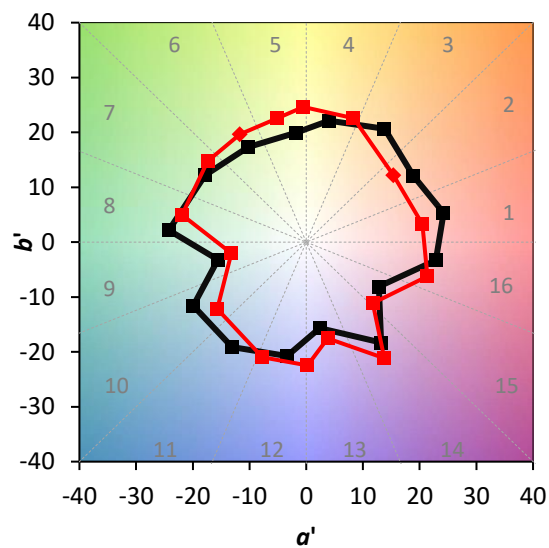
**TM-30-18**

**Summary**

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



**Color Vector Graphics**

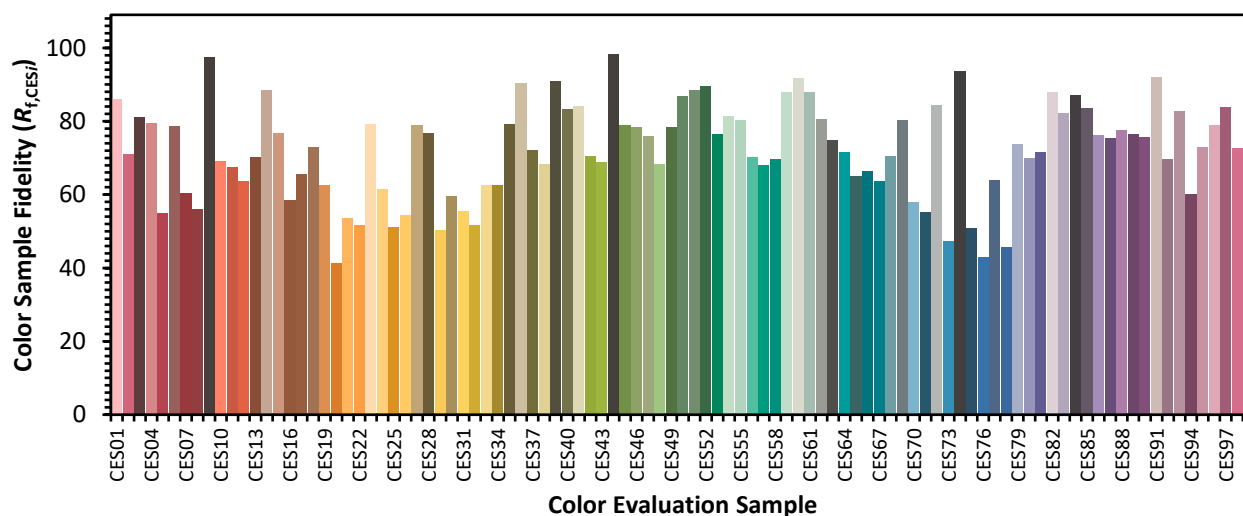


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**Individual Sample Fidelity Index ( $R_{f,i}$ )**

|            |            |            |            |
|------------|------------|------------|------------|
| 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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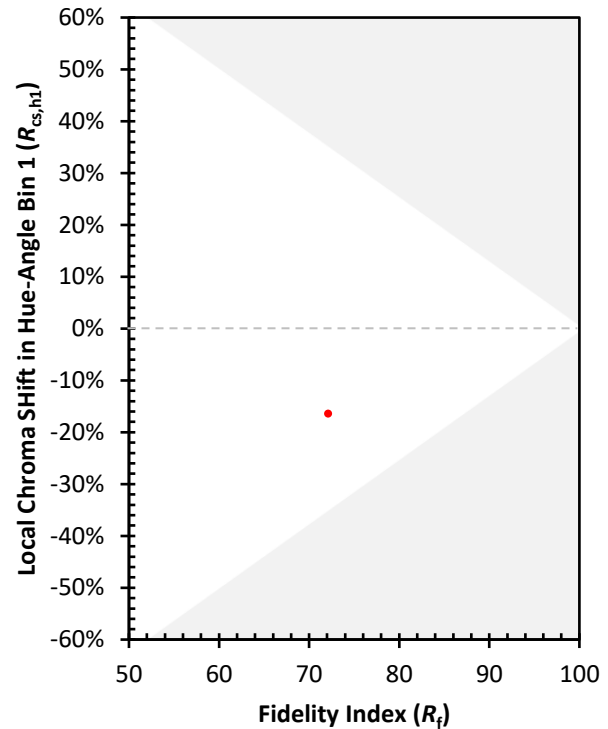
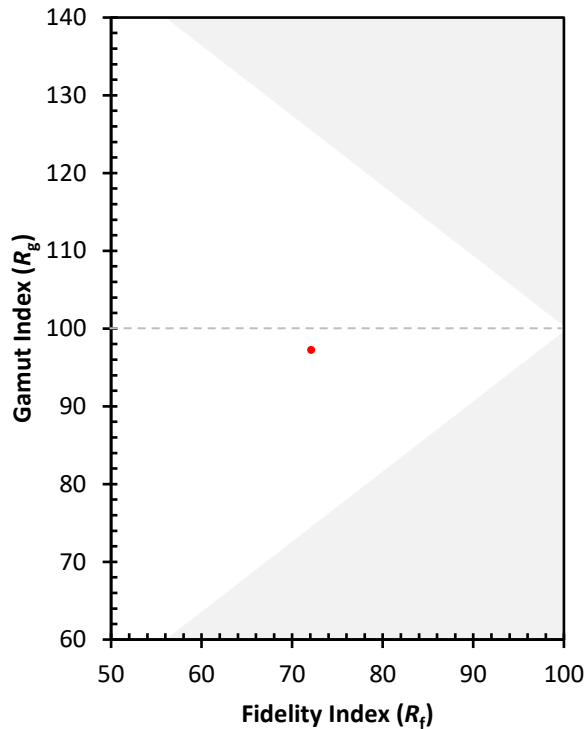
Color Rendition by Hue-Angle Bin



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**Measure Comparisons**



(END OF REPORT)