

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: P324783

Luminaire Tested: **GLEON-SA9D-730-U-AFL-HSS**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P324783  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-30)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA9D-730-U-AFL-HSS  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(9) 70 CRI, 3000K, 1200mA LIGHTSQUARES WITH 16 LEDS EACH AND AUTOMOTIVE  
FRONTLINE OPTICS WITH HOUSE SIDE SHIELD  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 51714 lumens  
Efficiency: N/A  
Efficacy: 89.9 lumens/watt  
Luminous Opening: Rectangular (W 2.5' x L: 1' x H: 0')  
IES Classification: Type II - Short  
BUG Rating: B3 - U0 - G4

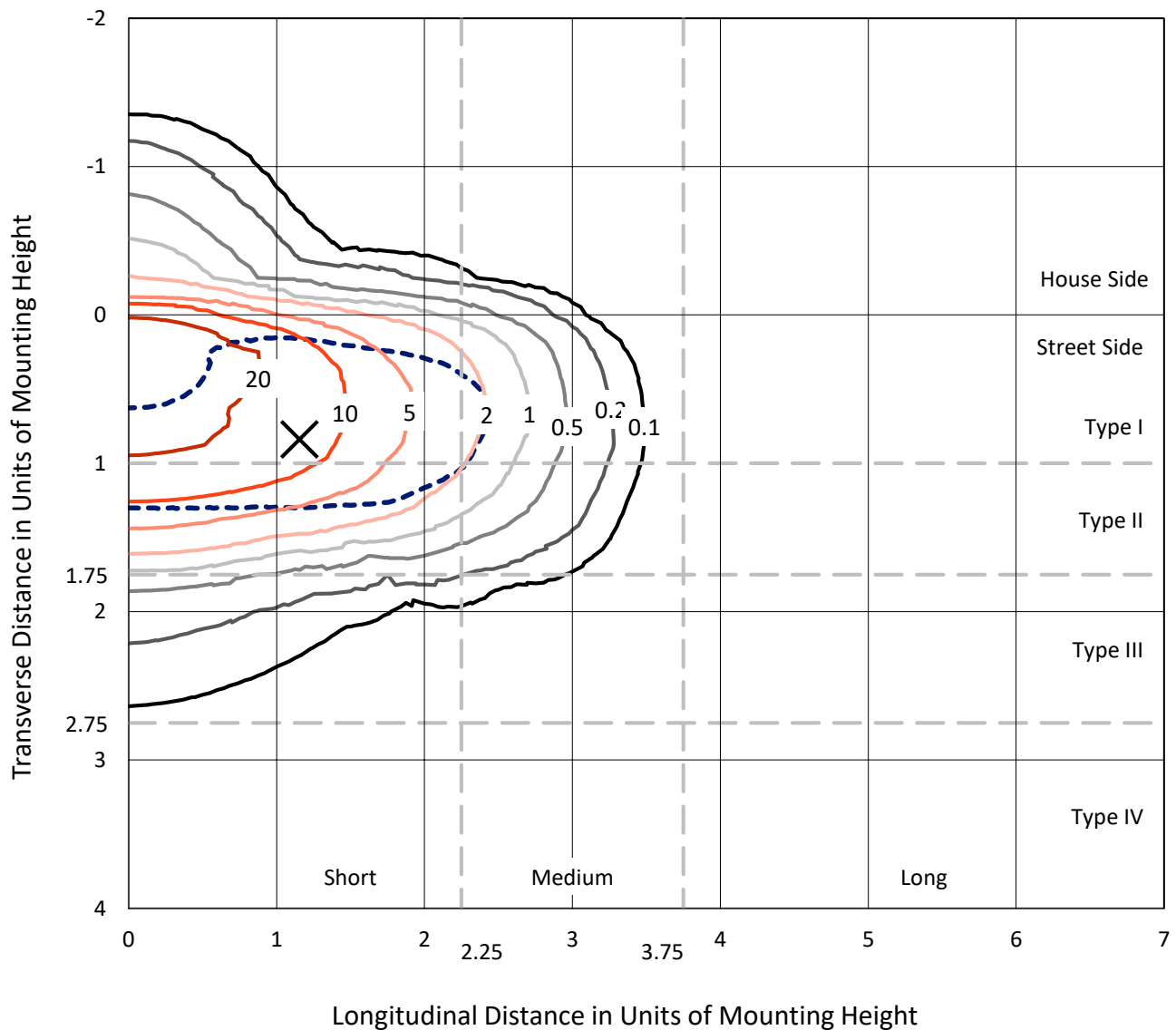
Input Watts (W): 575  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



REPORT NUMBER: P324783  
 CATALOG NUMBER: GLEON-SA9D-730-U-AFL-HSS

## Iso-Footcandle Lines of Horizontal Illumination

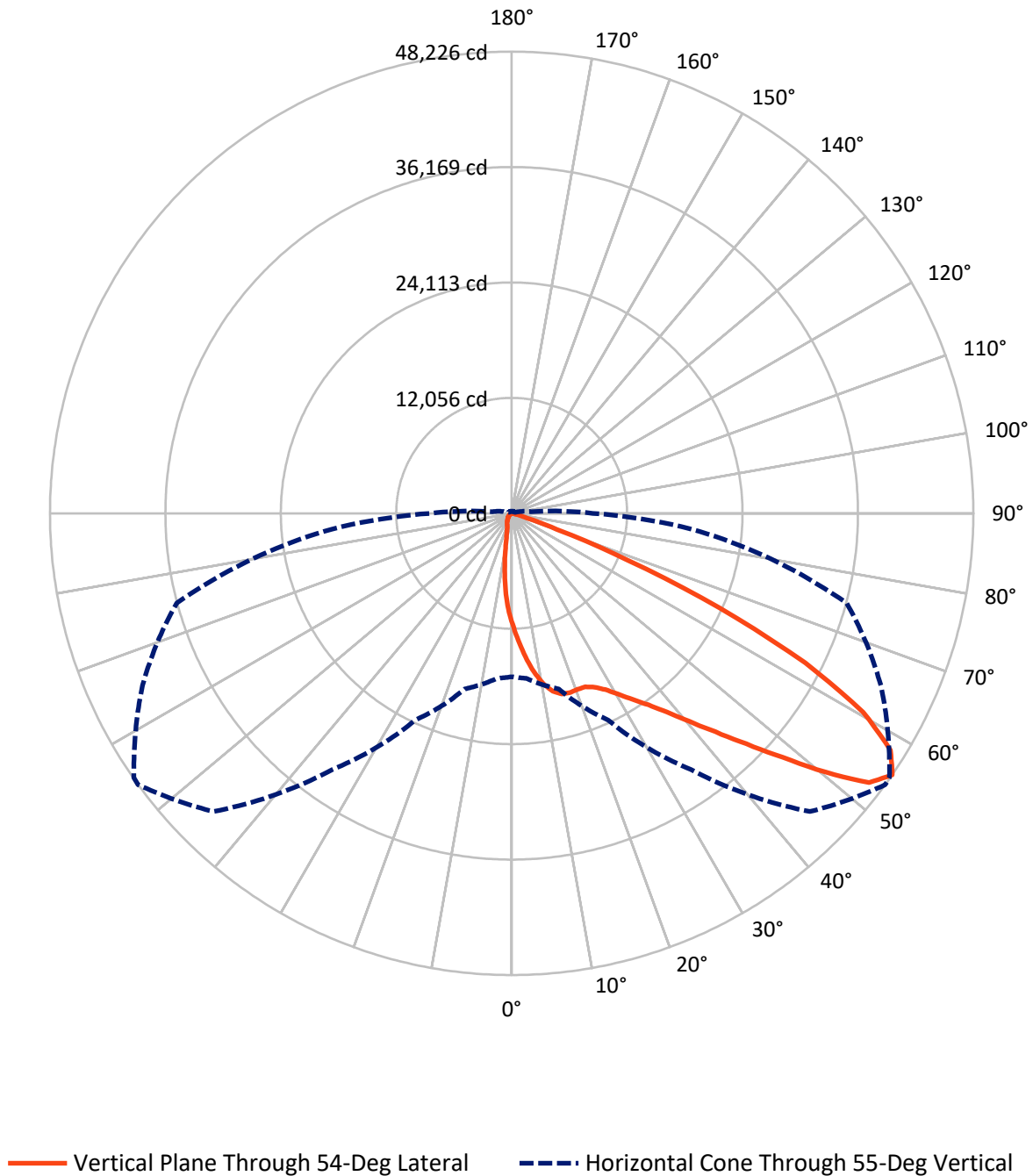
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 28.5 fc  
 Type II - Short - N/A

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## Luminous Intensity Polar Plot



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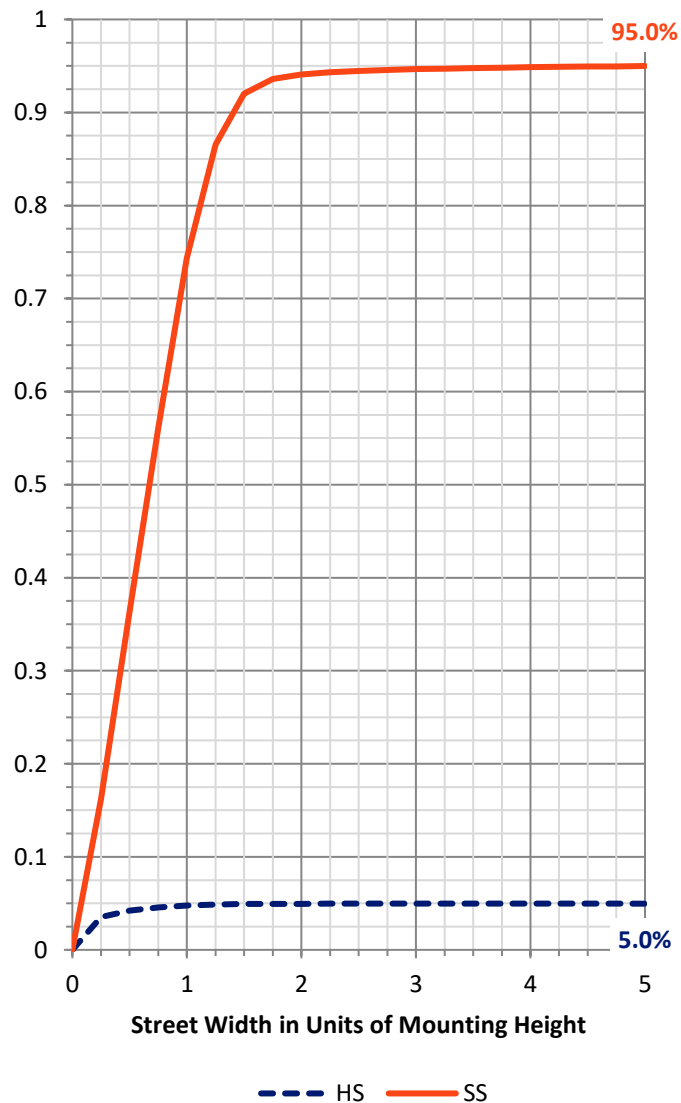
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 2580.2   | 0.0    | 2580.2  |
|                    | % Fixture | 5.0      | 0.0    | 5.0     |
| <b>Street Side</b> | Lumens    | 49133.9  | 0.0    | 49133.9 |
|                    | % Fixture | 95.0     | 0.0    | 95.0    |
| <b>Total</b>       | Lumens    | 51714.0  | 0.0    | 51714.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 1066.6  | 2.1       |
| 10°-20°   | 2925.1  | 5.7       |
| 20°-30°   | 4994.1  | 9.7       |
| 30°-40°   | 8014.6  | 15.5      |
| 40°-50°   | 12807.4 | 24.8      |
| 50°-60°   | 13723.5 | 26.5      |
| 60°-70°   | 7046.0  | 13.6      |
| 70°-80°   | 1067.3  | 2.1       |
| 80°-90°   | 69.5    | 0.1       |
| 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°    | 51714.0 | 100.0     |
| 0°-180°   | 51714.0 | 100.0     |

**Coefficient of Utilization**



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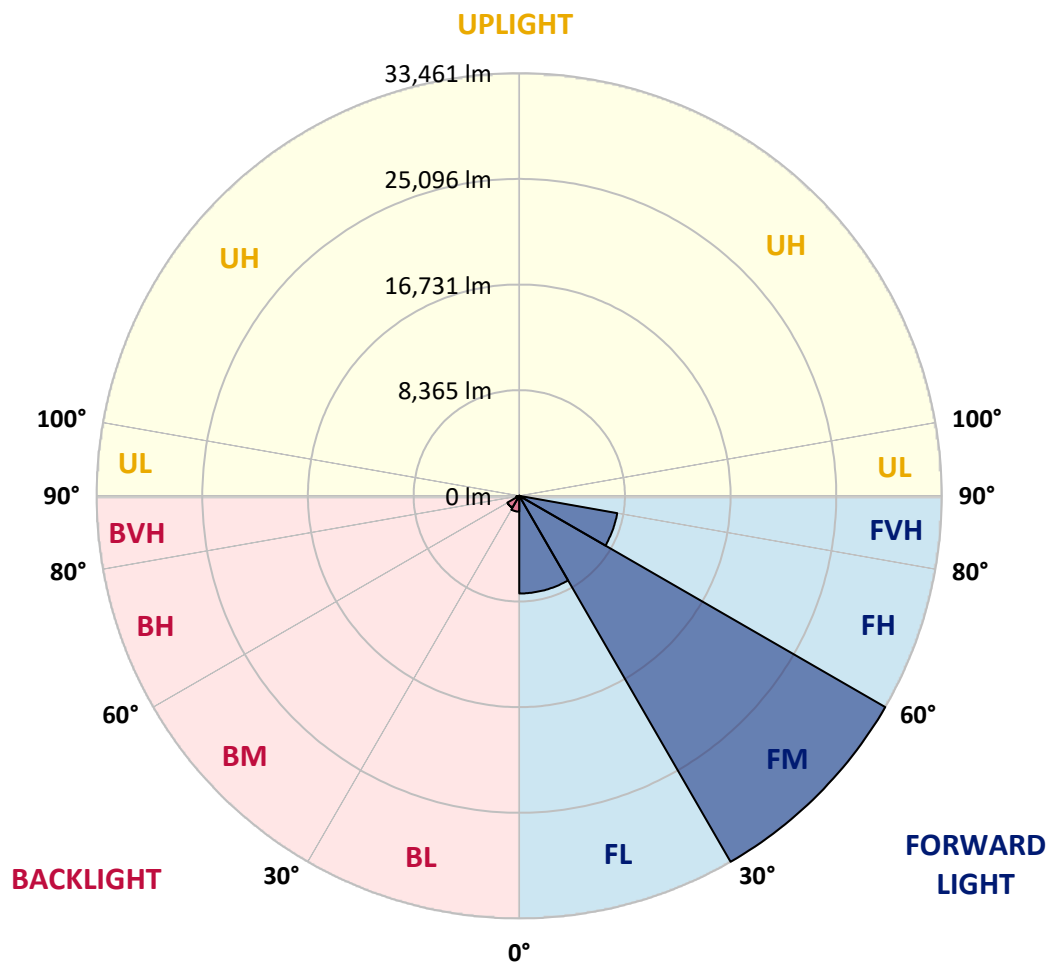
CATALOG NUMBER: GLEON-SA9D-730-U-AFL-HSS

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

| Zone |             | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |          |
|------|-------------|---------|-----------|-------------------------|------|----------|
|      |             |         |           | B                       | U    | G        |
| FL   | (0°-30°)    | 7730.3  | 14.9      |                         |      |          |
| FM   | (30°-60°)   | 33461.2 | 64.7      |                         |      |          |
| FH   | (60°-80°)   | 7875.6  | 15.2      |                         |      | G4/12000 |
| FVH  | (80°-90°)   | 66.7    | 0.1       |                         |      | G1/100   |
| BL   | (0°-30°)    | 1255.3  | 2.4       | B3/2500                 |      |          |
| BM   | (30°-60°)   | 1084.2  | 2.1       | B2/2500                 |      |          |
| BH   | (60°-80°)   | 237.8   | 0.5       | B1/500                  |      | G1/500   |
| BVH  | (80°-90°)   | 2.8     | 0.0       |                         |      | G0/10    |
| UL   | (90°-100°)  | 0.0     | 0.0       |                         | U0/0 |          |
| UH   | (100°-180°) | 0.0     | 0.0       |                         | U0/0 |          |

**BUG Rating: B3-U0-G4**

Type II Short





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 45°     | 54°     | 55°     | 65°     | 75°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 11581.9 | 11581.9 | 11581.9 | 11581.9 | 11581.9 | 11581.9 | 11581.9 | 11581.9 | 11581.9 | 11581.9 | 11581.9 |
| 2.5°  | 14534.3 | 14317.6 | 14324.3 | 14226.1 | 13866.5 | 13585.1 | 13292.6 | 13223.3 | 12767.7 | 12289.8 | 11829.8 |
| 5°    | 17046.7 | 16888.2 | 16850.2 | 16660.4 | 16160.1 | 15630.8 | 15063.6 | 14931.8 | 14040.7 | 13062.5 | 12100.0 |
| 7.5°  | 18337.6 | 18339.8 | 18308.5 | 18239.3 | 17926.6 | 17413.0 | 16720.7 | 16582.2 | 15369.5 | 13902.3 | 12381.4 |
| 10°   | 17962.4 | 18047.2 | 18221.4 | 18451.5 | 18690.4 | 18625.7 | 18105.3 | 17980.2 | 16662.6 | 14791.1 | 12694.0 |
| 12.5° | 17086.9 | 17098.1 | 17292.4 | 17669.8 | 18357.7 | 19063.4 | 19072.3 | 19029.9 | 17897.6 | 15720.2 | 13038.0 |
| 15°   | 16651.4 | 16693.9 | 16765.3 | 17008.8 | 17660.9 | 18790.9 | 19599.4 | 19659.7 | 19029.9 | 16707.3 | 13404.2 |
| 17.5° | 16937.3 | 16997.6 | 16937.3 | 16966.3 | 17343.8 | 18359.9 | 19690.9 | 19845.0 | 20019.2 | 17683.2 | 13750.4 |
| 20°   | 17712.3 | 17768.1 | 17660.9 | 17542.5 | 17616.2 | 18234.8 | 19626.2 | 19833.9 | 20794.2 | 18549.7 | 14040.7 |
| 22.5° | 18757.4 | 18779.8 | 18616.7 | 18422.4 | 18368.8 | 18659.2 | 19679.8 | 19894.2 | 21415.1 | 19333.6 | 14223.8 |
| 25°   | 19907.6 | 19927.7 | 19724.4 | 19501.1 | 19373.8 | 19492.2 | 20119.7 | 20280.5 | 21962.2 | 20081.8 | 14328.8 |
| 27.5° | 21160.5 | 21178.3 | 20923.7 | 20649.0 | 20501.6 | 20506.1 | 20845.6 | 21017.5 | 22545.1 | 20934.9 | 14413.7 |
| 30°   | 22484.8 | 22475.9 | 22241.4 | 21859.5 | 21671.9 | 21667.4 | 21890.7 | 22064.9 | 23389.3 | 22029.2 | 14529.8 |
| 32.5° | 23972.2 | 23954.3 | 23621.5 | 23148.1 | 22935.9 | 22967.2 | 23166.0 | 23266.5 | 24436.7 | 23195.0 | 14737.5 |
| 35°   | 25930.8 | 25879.4 | 25376.9 | 24789.6 | 24398.7 | 24387.6 | 24555.1 | 24635.5 | 25772.2 | 24606.4 | 15083.7 |
| 37.5° | 28472.3 | 28425.4 | 27744.2 | 26891.1 | 26341.7 | 26136.2 | 26335.0 | 26437.7 | 27677.2 | 26417.6 | 15639.8 |
| 40°   | 30978.0 | 30931.1 | 30526.9 | 29745.2 | 28898.8 | 28405.3 | 28561.6 | 28671.0 | 30055.7 | 28615.2 | 16341.0 |
| 42.5° | 32706.6 | 32746.8 | 32887.5 | 32952.2 | 32159.4 | 31123.2 | 31194.6 | 31308.5 | 32554.7 | 30964.6 | 17142.8 |
| 45°   | 33162.2 | 33249.3 | 34044.3 | 35605.4 | 35902.4 | 35094.0 | 34345.8 | 34408.4 | 35094.0 | 33314.0 | 17944.5 |
| 47.5° | 31793.2 | 31954.0 | 33488.2 | 36391.5 | 38906.2 | 39477.9 | 38062.0 | 37979.4 | 37530.5 | 35214.6 | 18514.0 |
| 50°   | 28682.2 | 28829.6 | 30817.2 | 35111.8 | 39817.4 | 43663.1 | 42515.2 | 42271.8 | 39667.8 | 36351.3 | 18715.0 |
| 52.5° | 24179.9 | 24358.5 | 25973.2 | 31083.0 | 38100.0 | 45530.2 | 46731.7 | 46528.4 | 41235.5 | 36440.7 | 18748.5 |
| 55°   | 17075.8 | 17292.4 | 19000.9 | 23822.5 | 32657.5 | 44045.0 | 48225.7 | 48165.4 | 42537.5 | 36203.9 | 18820.0 |
| 57.5° | 9596.5  | 9752.8  | 11595.3 | 15271.3 | 23918.6 | 38363.5 | 46664.7 | 47064.4 | 43323.7 | 35793.0 | 18927.2 |
| 60°   | 4261.1  | 4303.6  | 5257.2  | 7602.1  | 14002.8 | 29318.7 | 42195.8 | 42870.3 | 42649.2 | 35243.6 | 19108.1 |
| 62.5° | 2362.8  | 2327.1  | 2327.1  | 3160.1  | 6085.7  | 18150.0 | 34408.4 | 35522.8 | 39770.5 | 34593.7 | 19117.0 |
| 65°   | 1851.4  | 1817.9  | 1721.9  | 1735.3  | 2318.2  | 8055.5  | 23827.0 | 25807.9 | 34303.4 | 32688.7 | 18473.8 |
| 67.5° | 1570.0  | 1541.0  | 1444.9  | 1407.0  | 1440.5  | 2657.6  | 13091.6 | 15148.4 | 26029.0 | 27737.5 | 16001.5 |
| 70°   | 1326.6  | 1306.5  | 1257.3  | 1210.4  | 1125.6  | 1313.2  | 5009.3  | 6407.3  | 16039.5 | 18451.5 | 10923.0 |
| 72.5° | 1067.5  | 1058.6  | 1076.4  | 1036.2  | 933.5   | 875.5   | 1712.9  | 2074.7  | 7204.6  | 8234.2  | 4500.1  |
| 75°   | 920.1   | 915.7   | 924.6   | 884.4   | 768.3   | 609.7   | 871.0   | 951.4   | 2032.3  | 2014.4  | 911.2   |
| 77.5° | 598.5   | 605.2   | 766.0   | 748.2   | 661.1   | 406.5   | 451.1   | 486.9   | 616.4   | 462.3   | 276.9   |
| 80°   | 381.9   | 377.4   | 388.6   | 620.9   | 594.1   | 310.4   | 225.6   | 236.7   | 297.0   | 227.8   | 134.0   |
| 82.5° | 232.3   | 227.8   | 254.6   | 290.3   | 299.3   | 216.6   | 138.5   | 140.7   | 185.4   | 147.4   | 71.5    |
| 85°   | 20.1    | 26.8    | 154.1   | 142.9   | 102.7   | 67.0    | 67.0    | 71.5    | 98.3    | 87.1    | 40.2    |
| 87.5° | 0.0     | 0.0     | 26.8    | 40.2    | 22.3    | 24.6    | 24.6    | 26.8    | 38.0    | 38.0    | 20.1    |
| 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: P324783

CATALOG NUMBER: GLEON-SA9D-730-U-AFL-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°     | 95°     | 105°    | 115°    | 125°    | 135°    | 145°    | 155°    | 165°    | 175°    | 180°    |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 11581.9 | 11581.9 | 11581.9 | 11581.9 | 11581.9 | 11581.9 | 11581.9 | 11581.9 | 11581.9 | 11581.9 | 11581.9 |
| 2.5°  | 11590.8 | 11358.5 | 10889.5 | 10438.4 | 10056.5 | 9688.0  | 9268.2  | 8852.8  | 8658.5  | 8580.3  | 8499.9  |
| 5°    | 11610.9 | 11133.0 | 10166.0 | 9192.2  | 8182.8  | 7273.8  | 6498.9  | 5703.8  | 5306.3  | 5132.1  | 5051.7  |
| 7.5°  | 11637.7 | 10909.6 | 9346.3  | 7711.6  | 6085.7  | 4852.9  | 3776.5  | 3084.2  | 2784.9  | 2738.0  | 2621.9  |
| 10°   | 11642.2 | 10639.4 | 8395.0  | 6076.8  | 4080.2  | 2925.6  | 2251.2  | 1893.8  | 1762.1  | 1739.7  | 1701.8  |
| 12.5° | 11651.1 | 10320.0 | 7338.6  | 4500.1  | 2720.2  | 1956.4  | 1628.1  | 1509.7  | 1474.0  | 1471.7  | 1471.7  |
| 15°   | 11677.9 | 9985.1  | 6242.1  | 3242.7  | 1954.1  | 1549.9  | 1429.3  | 1382.4  | 1369.0  | 1375.7  | 1373.5  |
| 17.5° | 11677.9 | 9589.8  | 5165.6  | 2416.4  | 1578.9  | 1393.6  | 1326.6  | 1295.3  | 1290.8  | 1297.5  | 1299.8  |
| 20°   | 11593.0 | 9109.6  | 4178.5  | 1880.4  | 1400.3  | 1293.1  | 1232.8  | 1203.7  | 1192.6  | 1197.0  | 1199.3  |
| 22.5° | 11389.8 | 8520.0  | 3374.5  | 1556.6  | 1281.9  | 1201.5  | 1136.7  | 1092.1  | 1074.2  | 1076.4  | 1076.4  |
| 25°   | 11072.7 | 7821.0  | 2639.8  | 1346.7  | 1185.9  | 1103.2  | 1027.3  | 975.9   | 964.8   | 962.5   | 967.0   |
| 27.5° | 10666.2 | 7048.3  | 2101.5  | 1185.9  | 1072.0  | 993.8   | 917.9   | 875.5   | 866.5   | 868.8   | 871.0   |
| 30°   | 10266.5 | 6246.5  | 1657.1  | 1049.6  | 944.7   | 871.0   | 812.9   | 792.8   | 792.8   | 799.5   | 801.8   |
| 32.5° | 9900.2  | 5476.0  | 1310.9  | 931.3   | 830.8   | 763.8   | 730.3   | 728.1   | 739.2   | 743.7   | 745.9   |
| 35°   | 9585.3  | 4763.6  | 1085.4  | 839.7   | 741.5   | 683.4   | 672.2   | 681.2   | 694.6   | 703.5   | 705.7   |
| 37.5° | 9362.0  | 4127.1  | 949.1   | 763.8   | 672.2   | 625.3   | 623.1   | 641.0   | 658.8   | 678.9   | 683.4   |
| 40°   | 9268.2  | 3588.9  | 855.4   | 696.8   | 616.4   | 580.7   | 574.0   | 598.5   | 632.0   | 661.1   | 665.5   |
| 42.5° | 9190.0  | 3148.9  | 775.0   | 632.0   | 571.7   | 520.4   | 518.1   | 549.4   | 589.6   | 618.6   | 625.3   |
| 45°   | 9123.0  | 2796.1  | 701.3   | 562.8   | 513.7   | 446.7   | 453.4   | 493.6   | 524.8   | 556.1   | 562.8   |
| 47.5° | 8984.5  | 2505.8  | 620.9   | 489.1   | 424.3   | 381.9   | 395.3   | 431.0   | 455.6   | 502.5   | 509.2   |
| 50°   | 8736.6  | 2269.0  | 538.2   | 399.8   | 346.2   | 330.5   | 350.6   | 375.2   | 406.5   | 446.7   | 451.1   |
| 52.5° | 8569.1  | 2090.4  | 466.8   | 335.0   | 285.9   | 290.3   | 310.4   | 319.4   | 337.2   | 352.9   | 348.4   |
| 55°   | 8473.1  | 1992.1  | 408.7   | 290.3   | 243.4   | 256.8   | 261.3   | 250.1   | 241.2   | 225.6   | 218.9   |
| 57.5° | 8461.9  | 1902.8  | 364.0   | 252.4   | 214.4   | 221.1   | 205.5   | 167.5   | 136.2   | 118.4   | 113.9   |
| 60°   | 8444.1  | 1793.3  | 328.3   | 212.2   | 189.8   | 180.9   | 147.4   | 91.6    | 64.8    | 60.3    | 60.3    |
| 62.5° | 8249.8  | 1623.6  | 301.5   | 178.7   | 160.8   | 136.2   | 84.9    | 42.4    | 35.7    | 38.0    | 38.0    |
| 65°   | 7631.2  | 1386.9  | 274.7   | 145.2   | 127.3   | 98.3    | 42.4    | 24.6    | 13.4    | 15.6    | 15.6    |
| 67.5° | 6487.7  | 1105.5  | 245.7   | 111.7   | 96.0    | 62.5    | 24.6    | 11.2    | 0.0     | 0.0     | 0.0     |
| 70°   | 4343.8  | 685.6   | 207.7   | 78.2    | 62.5    | 38.0    | 17.9    | 2.2     | 0.0     | 0.0     | 0.0     |
| 72.5° | 1666.0  | 370.7   | 167.5   | 46.9    | 40.2    | 26.8    | 11.2    | 0.0     | 0.0     | 0.0     | 0.0     |
| 75°   | 375.2   | 243.4   | 116.1   | 33.5    | 29.0    | 17.9    | 4.5     | 0.0     | 0.0     | 0.0     | 0.0     |
| 77.5° | 142.9   | 176.4   | 67.0    | 22.3    | 20.1    | 11.2    | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| 80°   | 69.2    | 105.0   | 31.3    | 13.4    | 11.2    | 4.5     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| 82.5° | 35.7    | 40.2    | 13.4    | 6.7     | 4.5     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| 85°   | 20.1    | 20.1    | 6.7     | 4.5     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| 87.5° | 11.2    | 6.7     | 2.2     | 2.2     | 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: SP1-1908-441-2-R4

Test Date: 10/03/2019

Luminaire Tested: SA1C-730-U-5WQ

Data in this report applies to families of products SA1C-730-U-5WQ .

### Test Information

Test Method: LM-79-2008  
 Report Number: SP1-1908-441-2-R4  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry:  $4\pi$   
 Issue Date: 10/28/2024  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: MCGRAW-EDISON  
 Catalog Number: **SA1C-730-U-5WQ**  
 Description: MCGRAW EDISON ROADWAY AND AREA LUMINAIRE

\*\*\*THIS IS A REVISION OF SP1-1908-441-2-R3. TO UPDATE THE CATALOG INFORMATION.\*\*\*TESTED IN SITU. (1) 70 CRI, 3000K, 1050MA LIGHTSQUARE WITH 16 LEDS AND TYPE V WIDE OPTICS.

### Spectral Parameters

|                           |        |           |      |      |       |
|---------------------------|--------|-----------|------|------|-------|
| CCT (K):                  | 2993   | CRI (Ra): | 71.8 |      |       |
| CIE u':                   | 0.2508 | R1:       | 67.5 | R9:  | -38.3 |
| CIE v':                   | 0.5215 | R2:       | 82.9 | R10: | 62.5  |
| Duv:                      | 0.0000 | R3:       | 94.7 | R11: | 63.7  |
| CIE x:                    | 0.4374 | R4:       | 67.7 | R12: | 57.8  |
| CIE y:                    | 0.4043 | R5:       | 67.9 | R13: | 70.4  |
| CIE z:                    | 0.1583 | R6:       | 77.6 | R14: | 97.3  |
| Peak Wavelength (nm):     | 593    | R7:       | 76.0 |      |       |
| Dominant Wavelength (nm): | 582    | R8:       | 40.5 |      |       |
| Purity:                   | 53     |           |      |      |       |
| Rf:                       | 75.7   |           |      |      |       |
| Rg:                       | 93.9   |           |      |      |       |



### Test Conditions

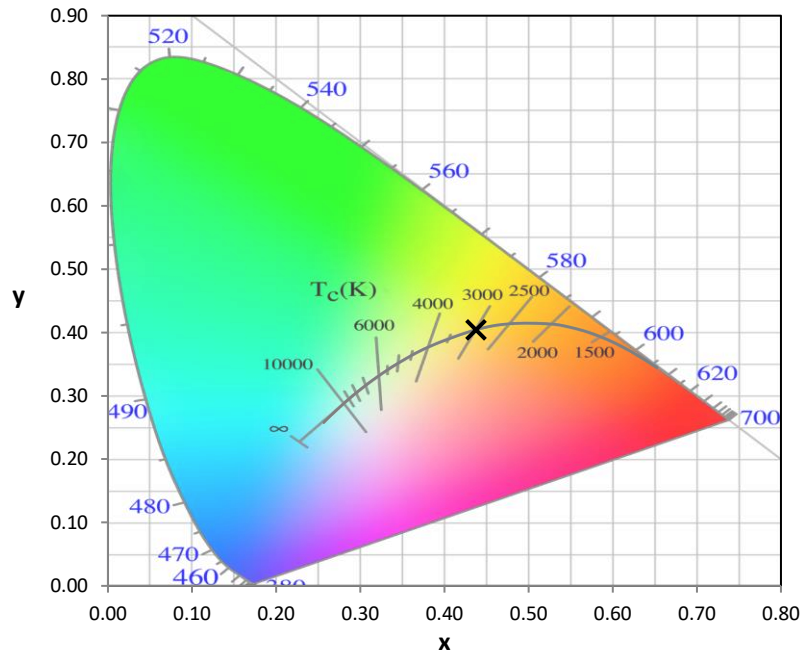
Stabilization Time: 53M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 25.0./44%  
 Sphere Temperature (°C): 25.7

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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 3000K 4-step quadrangle

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**Photopic Flux vs. Wavelength**



#####

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 2397             | NR               | 490       | 24908            | NR               | 620       | 118784           | NR               | 750       | 5037             | NR               | 880       | 2677             | NR               |
| 365       | 2084             | NR               | 495       | 30998            | NR               | 625       | 108951           | NR               | 755       | 4413             | NR               | 885       | 2940             | NR               |
| 370       | 2143             | NR               | 500       | 37103            | NR               | 630       | 99573            | NR               | 760       | 4189             | NR               | 890       | 3116             | NR               |
| 375       | 2413             | NR               | 505       | 42987            | NR               | 635       | 90444            | NR               | 765       | 3677             | NR               | 895       | 3345             | NR               |
| 380       | 2172             | NR               | 510       | 48702            | NR               | 640       | 80749            | NR               | 770       | 3366             | NR               | 900       | 2312             | NR               |
| 385       | 1997             | NR               | 515       | 53741            | NR               | 645       | 71664            | NR               | 775       | 3211             | NR               | 905       | 2829             | NR               |
| 390       | 1830             | NR               | 520       | 57283            | NR               | 650       | 63936            | NR               | 780       | 2682             | NR               | 910       | 2783             | NR               |
| 395       | 1861             | NR               | 525       | 61876            | NR               | 655       | 56611            | NR               | 785       | 2804             | NR               | 915       | 2662             | NR               |
| 400       | 1717             | NR               | 530       | 65398            | NR               | 660       | 49763            | NR               | 790       | 2581             | NR               | 920       | 3047             | NR               |
| 405       | 1761             | NR               | 535       | 69597            | NR               | 665       | 42891            | NR               | 795       | 2711             | NR               | 925       | 2256             | NR               |
| 410       | 2680             | NR               | 540       | 74214            | NR               | 670       | 36939            | NR               | 800       | 2609             | NR               | 930       | 2976             | NR               |
| 415       | 4374             | NR               | 545       | 79911            | NR               | 675       | 31946            | NR               | 805       | 2581             | NR               | 935       | 3503             | NR               |
| 420       | 8071             | NR               | 550       | 86153            | NR               | 680       | 27385            | NR               | 810       | 2404             | NR               | 940       | 4226             | NR               |
| 425       | 15169            | NR               | 555       | 93952            | NR               | 685       | 23504            | NR               | 815       | 2556             | NR               | 945       | 2930             | NR               |
| 430       | 26038            | NR               | 560       | 102904           | NR               | 690       | 20210            | NR               | 820       | 2742             | NR               | 950       | 2115             | NR               |
| 435       | 41316            | NR               | 565       | 112009           | NR               | 695       | 17459            | NR               | 825       | 2014             | NR               | 955       | 2634             | NR               |
| 440       | 59674            | NR               | 570       | 121662           | NR               | 700       | 15207            | NR               | 830       | 2488             | NR               | 960       | 4200             | NR               |
| 445       | 72751            | NR               | 575       | 130476           | NR               | 705       | 13322            | NR               | 835       | 2625             | NR               | 965       | 1982             | NR               |
| 450       | 65091            | NR               | 580       | 137926           | NR               | 710       | 11676            | NR               | 840       | 2754             | NR               | 970       | 3613             | NR               |
| 455       | 44894            | NR               | 585       | 143406           | NR               | 715       | 10626            | NR               | 845       | 2708             | NR               | 975       | 4034             | NR               |
| 460       | 32712            | NR               | 590       | 147039           | NR               | 720       | 9416             | NR               | 850       | 2608             | NR               | 980       | 3922             | NR               |
| 465       | 25296            | NR               | 595       | 147365           | NR               | 725       | 8333             | NR               | 855       | 2605             | NR               | 985       | 1909             | NR               |
| 470       | 19318            | NR               | 600       | 145800           | NR               | 730       | 7134             | NR               | 860       | 1765             | NR               | 990       | 3617             | NR               |
| 475       | 17265            | NR               | 605       | 141363           | NR               | 735       | 6437             | NR               | 865       | 2581             | NR               | 995       | 4767             | NR               |
| 480       | 18260            | NR               | 610       | 134199           | NR               | 740       | 5834             | NR               | 870       | 3016             | NR               | 1000      | 2528             | NR               |
| 485       | 20845            | NR               | 615       | 127683           | NR               | 745       | 5500             | NR               | 875       | 3952             | NR               |           |                  |                  |

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**Scotopic Flux vs. Wavelength**



**Scotopic Lumens: 8494.8**

**S/P: 1.23**

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 2397             | NR               | 490       | 24908            | NR               | 620       | 118784           | NR               | 750       | 5037             | NR               | 880       | 2677             | NR               |
| 365       | 2084             | NR               | 495       | 30998            | NR               | 625       | 108951           | NR               | 755       | 4413             | NR               | 885       | 2940             | NR               |
| 370       | 2143             | NR               | 500       | 37103            | NR               | 630       | 99573            | NR               | 760       | 4189             | NR               | 890       | 3116             | NR               |
| 375       | 2413             | NR               | 505       | 42987            | NR               | 635       | 90444            | NR               | 765       | 3677             | NR               | 895       | 3345             | NR               |
| 380       | 2172             | NR               | 510       | 48702            | NR               | 640       | 80749            | NR               | 770       | 3366             | NR               | 900       | 2312             | NR               |
| 385       | 1997             | NR               | 515       | 53741            | NR               | 645       | 71664            | NR               | 775       | 3211             | NR               | 905       | 2829             | NR               |
| 390       | 1830             | NR               | 520       | 57283            | NR               | 650       | 63936            | NR               | 780       | 2682             | NR               | 910       | 2783             | NR               |
| 395       | 1861             | NR               | 525       | 61876            | NR               | 655       | 56611            | NR               | 785       | 2804             | NR               | 915       | 2662             | NR               |
| 400       | 1717             | NR               | 530       | 65398            | NR               | 660       | 49763            | NR               | 790       | 2581             | NR               | 920       | 3047             | NR               |
| 405       | 1761             | NR               | 535       | 69597            | NR               | 665       | 42891            | NR               | 795       | 2711             | NR               | 925       | 2256             | NR               |
| 410       | 2680             | NR               | 540       | 74214            | NR               | 670       | 36939            | NR               | 800       | 2609             | NR               | 930       | 2976             | NR               |
| 415       | 4374             | NR               | 545       | 79911            | NR               | 675       | 31946            | NR               | 805       | 2581             | NR               | 935       | 3503             | NR               |
| 420       | 8071             | NR               | 550       | 86153            | NR               | 680       | 27385            | NR               | 810       | 2404             | NR               | 940       | 4226             | NR               |
| 425       | 15169            | NR               | 555       | 93952            | NR               | 685       | 23504            | NR               | 815       | 2556             | NR               | 945       | 2930             | NR               |
| 430       | 26038            | NR               | 560       | 102904           | NR               | 690       | 20210            | NR               | 820       | 2742             | NR               | 950       | 2115             | NR               |
| 435       | 41316            | NR               | 565       | 112009           | NR               | 695       | 17459            | NR               | 825       | 2014             | NR               | 955       | 2634             | NR               |
| 440       | 59674            | NR               | 570       | 121662           | NR               | 700       | 15207            | NR               | 830       | 2488             | NR               | 960       | 4200             | NR               |
| 445       | 72751            | NR               | 575       | 130476           | NR               | 705       | 13322            | NR               | 835       | 2625             | NR               | 965       | 1982             | NR               |
| 450       | 65091            | NR               | 580       | 137926           | NR               | 710       | 11676            | NR               | 840       | 2754             | NR               | 970       | 3613             | NR               |
| 455       | 44894            | NR               | 585       | 143406           | NR               | 715       | 10626            | NR               | 845       | 2708             | NR               | 975       | 4034             | NR               |
| 460       | 32712            | NR               | 590       | 147039           | NR               | 720       | 9416             | NR               | 850       | 2608             | NR               | 980       | 3922             | NR               |
| 465       | 25296            | NR               | 595       | 147365           | NR               | 725       | 8333             | NR               | 855       | 2605             | NR               | 985       | 1909             | NR               |
| 470       | 19318            | NR               | 600       | 145800           | NR               | 730       | 7134             | NR               | 860       | 1765             | NR               | 990       | 3617             | NR               |
| 475       | 17265            | NR               | 605       | 141363           | NR               | 735       | 6437             | NR               | 865       | 2581             | NR               | 995       | 4767             | NR               |
| 480       | 18260            | NR               | 610       | 134199           | NR               | 740       | 5834             | NR               | 870       | 3016             | NR               | 1000      | 2528             | NR               |
| 485       | 20845            | NR               | 615       | 127683           | NR               | 745       | 5500             | NR               | 875       | 3952             | NR               |           |                  |                  |

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**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: 3101.5 M/P: 0.45**

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 2397             | NR               | 490       | 24908            | NR               | 620       | 118784           | NR               | 750       | 5037             | NR               | 880       | 2677             | NR               |
| 365       | 2084             | NR               | 495       | 30998            | NR               | 625       | 108951           | NR               | 755       | 4413             | NR               | 885       | 2940             | NR               |
| 370       | 2143             | NR               | 500       | 37103            | NR               | 630       | 99573            | NR               | 760       | 4189             | NR               | 890       | 3116             | NR               |
| 375       | 2413             | NR               | 505       | 42987            | NR               | 635       | 90444            | NR               | 765       | 3677             | NR               | 895       | 3345             | NR               |
| 380       | 2172             | NR               | 510       | 48702            | NR               | 640       | 80749            | NR               | 770       | 3366             | NR               | 900       | 2312             | NR               |
| 385       | 1997             | NR               | 515       | 53741            | NR               | 645       | 71664            | NR               | 775       | 3211             | NR               | 905       | 2829             | NR               |
| 390       | 1830             | NR               | 520       | 57283            | NR               | 650       | 63936            | NR               | 780       | 2682             | NR               | 910       | 2783             | NR               |
| 395       | 1861             | NR               | 525       | 61876            | NR               | 655       | 56611            | NR               | 785       | 2804             | NR               | 915       | 2662             | NR               |
| 400       | 1717             | NR               | 530       | 65398            | NR               | 660       | 49763            | NR               | 790       | 2581             | NR               | 920       | 3047             | NR               |
| 405       | 1761             | NR               | 535       | 69597            | NR               | 665       | 42891            | NR               | 795       | 2711             | NR               | 925       | 2256             | NR               |
| 410       | 2680             | NR               | 540       | 74214            | NR               | 670       | 36939            | NR               | 800       | 2609             | NR               | 930       | 2976             | NR               |
| 415       | 4374             | NR               | 545       | 79911            | NR               | 675       | 31946            | NR               | 805       | 2581             | NR               | 935       | 3503             | NR               |
| 420       | 8071             | NR               | 550       | 86153            | NR               | 680       | 27385            | NR               | 810       | 2404             | NR               | 940       | 4226             | NR               |
| 425       | 15169            | NR               | 555       | 93952            | NR               | 685       | 23504            | NR               | 815       | 2556             | NR               | 945       | 2930             | NR               |
| 430       | 26038            | NR               | 560       | 102904           | NR               | 690       | 20210            | NR               | 820       | 2742             | NR               | 950       | 2115             | NR               |
| 435       | 41316            | NR               | 565       | 112009           | NR               | 695       | 17459            | NR               | 825       | 2014             | NR               | 955       | 2634             | NR               |
| 440       | 59674            | NR               | 570       | 121662           | NR               | 700       | 15207            | NR               | 830       | 2488             | NR               | 960       | 4200             | NR               |
| 445       | 72751            | NR               | 575       | 130476           | NR               | 705       | 13322            | NR               | 835       | 2625             | NR               | 965       | 1982             | NR               |
| 450       | 65091            | NR               | 580       | 137926           | NR               | 710       | 11676            | NR               | 840       | 2754             | NR               | 970       | 3613             | NR               |
| 455       | 44894            | NR               | 585       | 143406           | NR               | 715       | 10626            | NR               | 845       | 2708             | NR               | 975       | 4034             | NR               |
| 460       | 32712            | NR               | 590       | 147039           | NR               | 720       | 9416             | NR               | 850       | 2608             | NR               | 980       | 3922             | NR               |
| 465       | 25296            | NR               | 595       | 147365           | NR               | 725       | 8333             | NR               | 855       | 2605             | NR               | 985       | 1909             | NR               |
| 470       | 19318            | NR               | 600       | 145800           | NR               | 730       | 7134             | NR               | 860       | 1765             | NR               | 990       | 3617             | NR               |
| 475       | 17265            | NR               | 605       | 141363           | NR               | 735       | 6437             | NR               | 865       | 2581             | NR               | 995       | 4767             | NR               |
| 480       | 18260            | NR               | 610       | 134199           | NR               | 740       | 5834             | NR               | 870       | 3016             | NR               | 1000      | 2528             | NR               |
| 485       | 20845            | NR               | 615       | 127683           | NR               | 745       | 5500             | NR               | 875       | 3952             | NR               |           |                  |                  |

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**Summary**

$R_f = 75.7$   
 $R_g = 93.9$   
 CIE  $R_a = 71.8$   
 $R_g = -38.3$



**Color Vector Graphics**

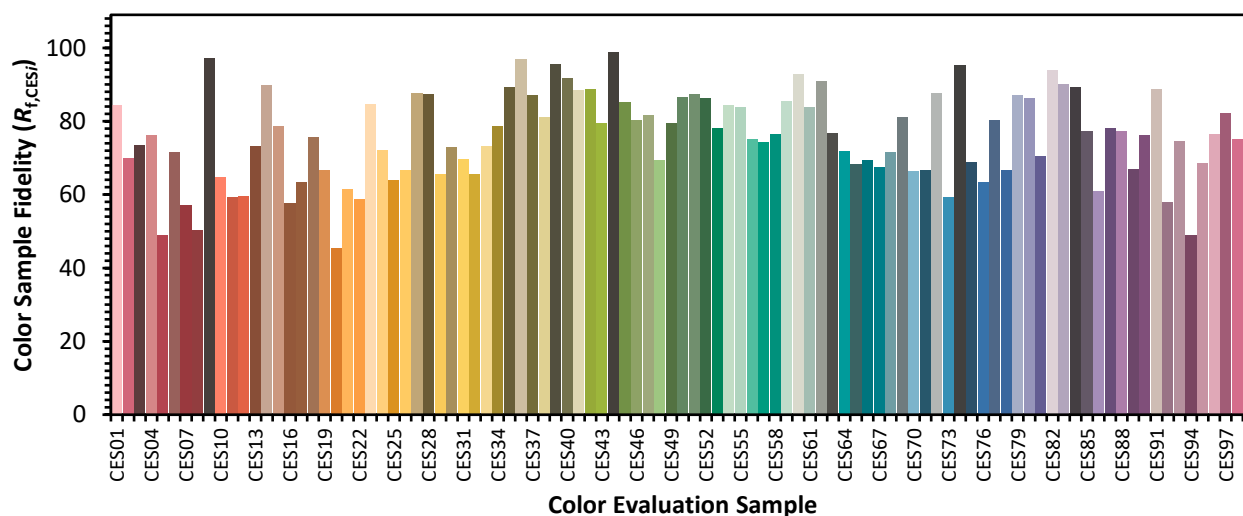


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**Individual Sample Fidelity Index ( $R_{f,i}$ )**

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 67 | CES51 = 87 | CES76 = 63 |
| CES02 = 63 | CES27 = 88 | CES52 = 86 | CES77 = 80 |
| CES03 = 31 | CES28 = 87 | CES53 = 78 | CES78 = 67 |
| CES04 = 71 | CES29 = 66 | CES54 = 84 | CES79 = 87 |
| CES05 = 49 | CES30 = 73 | CES55 = 84 | CES80 = 86 |
| CES06 = 51 | CES31 = 70 | CES56 = 75 | CES81 = 71 |
| CES07 = 41 | CES32 = 65 | CES57 = 74 | CES82 = 94 |
| CES08 = 40 | CES33 = 73 | CES58 = 76 | CES83 = 90 |
| CES09 = 29 | CES34 = 79 | CES59 = 85 | CES84 = 89 |
| CES10 = 76 | CES35 = 89 | CES60 = 93 | CES85 = 77 |
| CES11 = 59 | CES36 = 97 | CES61 = 84 | CES86 = 61 |
| CES12 = 65 | CES37 = 87 | CES62 = 91 | CES87 = 78 |
| CES13 = 43 | CES38 = 81 | CES63 = 77 | CES88 = 77 |
| CES14 = 74 | CES39 = 95 | CES64 = 72 | CES89 = 67 |
| CES15 = 71 | CES40 = 92 | CES65 = 68 | CES90 = 76 |
| CES16 = 47 | CES41 = 88 | CES66 = 69 | CES91 = 89 |
| CES17 = 50 | CES42 = 89 | CES67 = 67 | CES92 = 58 |
| CES18 = 56 | CES43 = 79 | CES68 = 72 | CES93 = 74 |
| CES19 = 73 | CES44 = 99 | CES69 = 81 | CES94 = 49 |
| CES20 = 66 | CES45 = 85 | CES70 = 66 | CES95 = 68 |
| CES21 = 87 | CES46 = 80 | CES71 = 67 | CES96 = 76 |
| CES22 = 79 | CES47 = 82 | CES72 = 88 | CES97 = 82 |
| CES23 = 92 | CES48 = 69 | CES73 = 59 | CES98 = 75 |
| CES24 = 91 | CES49 = 80 | CES74 = 95 | CES99 = 62 |
| CES25 = 73 | CES50 = 87 | CES75 = 69 |            |



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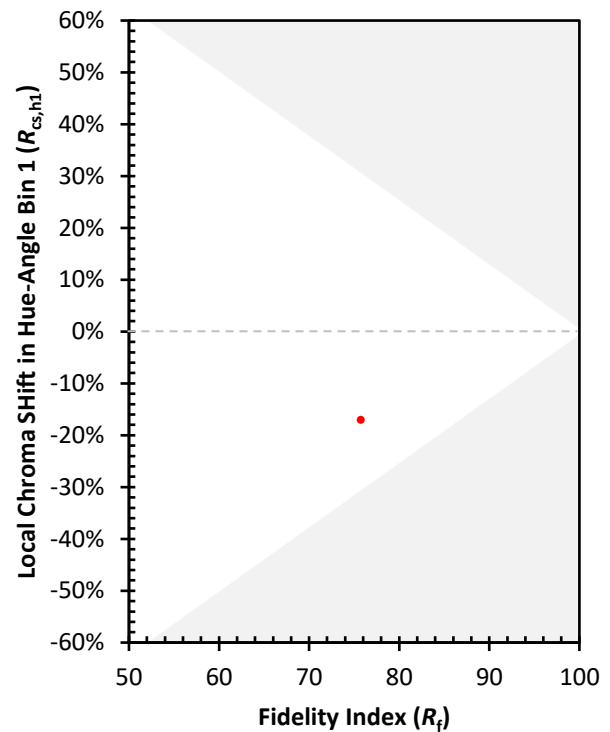
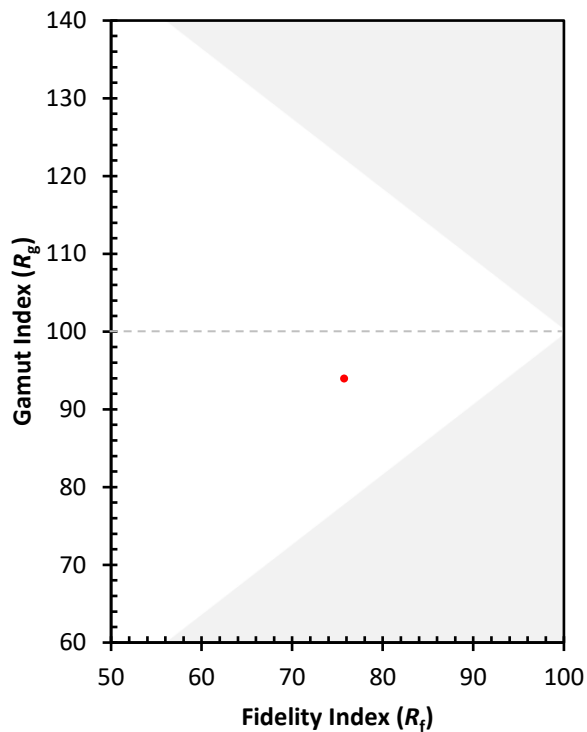
**Color Rendition by Hue-Angle Bin**



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**Measure Comparisons**



(END OF REPORT)