

Signify Classified - Internal  
Cooper Lighting Solutions Photometric Lab  
1121 Highway 74 South  
Peachtree City, GA 30269



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: P382727

Luminaire Tested: **GLEON-SA1A-735-U-T2**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P382727  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-12)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA1A-735-U-T2  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(1) 70 CRI, 3500K, 615mA LIGHTSQUARE WITH 16 LEDS AND TYPE II OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 4459.3 lumens  
Efficiency: N/A  
Efficacy: 131.2 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 0.5' x H: 0')  
IES Classification: Type III - Medium  
BUG Rating: B1 - U0 - G1

Input Watts (W): 34  
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

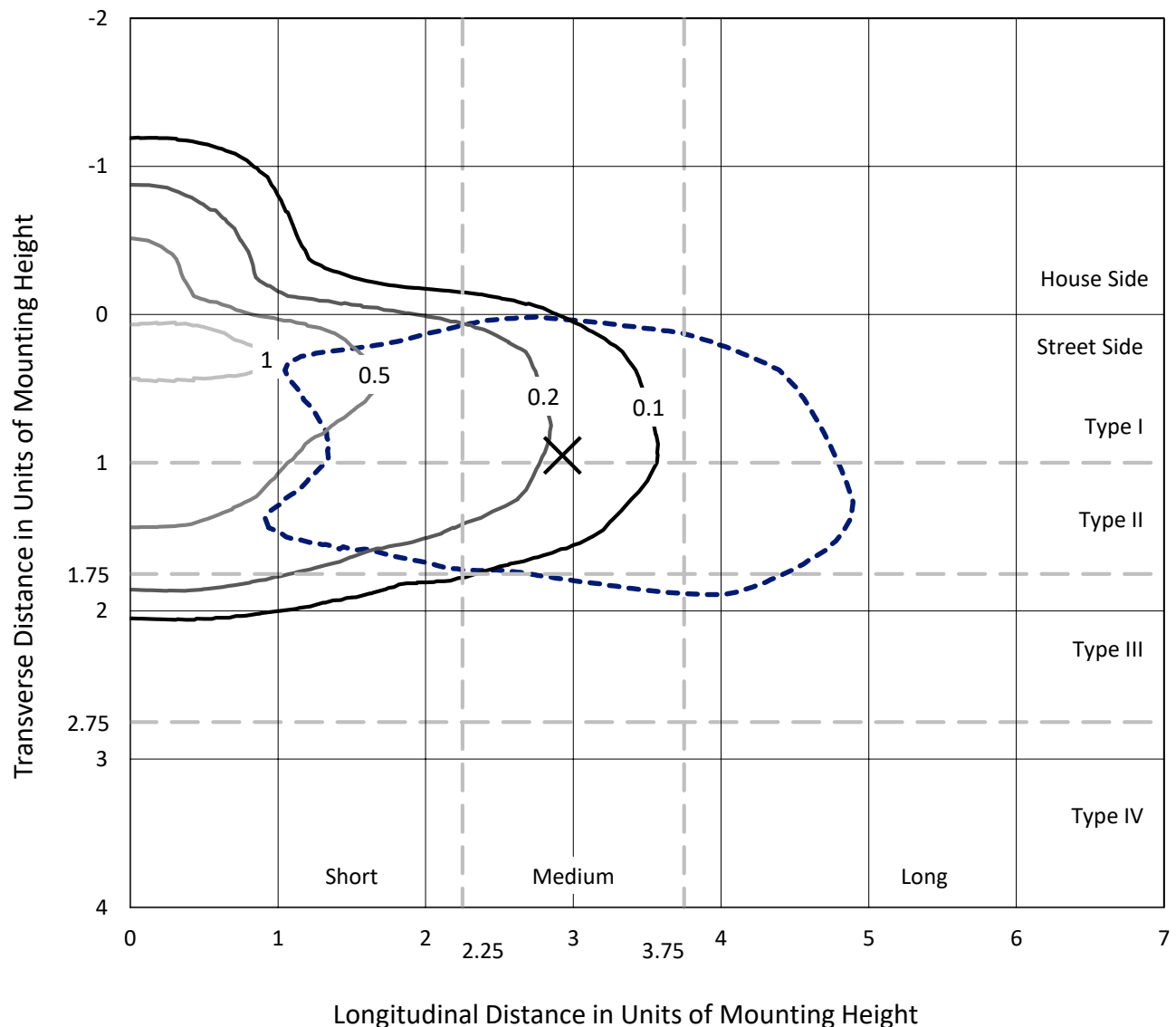


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## Iso-Footcandle Lines of Horizontal Illumination

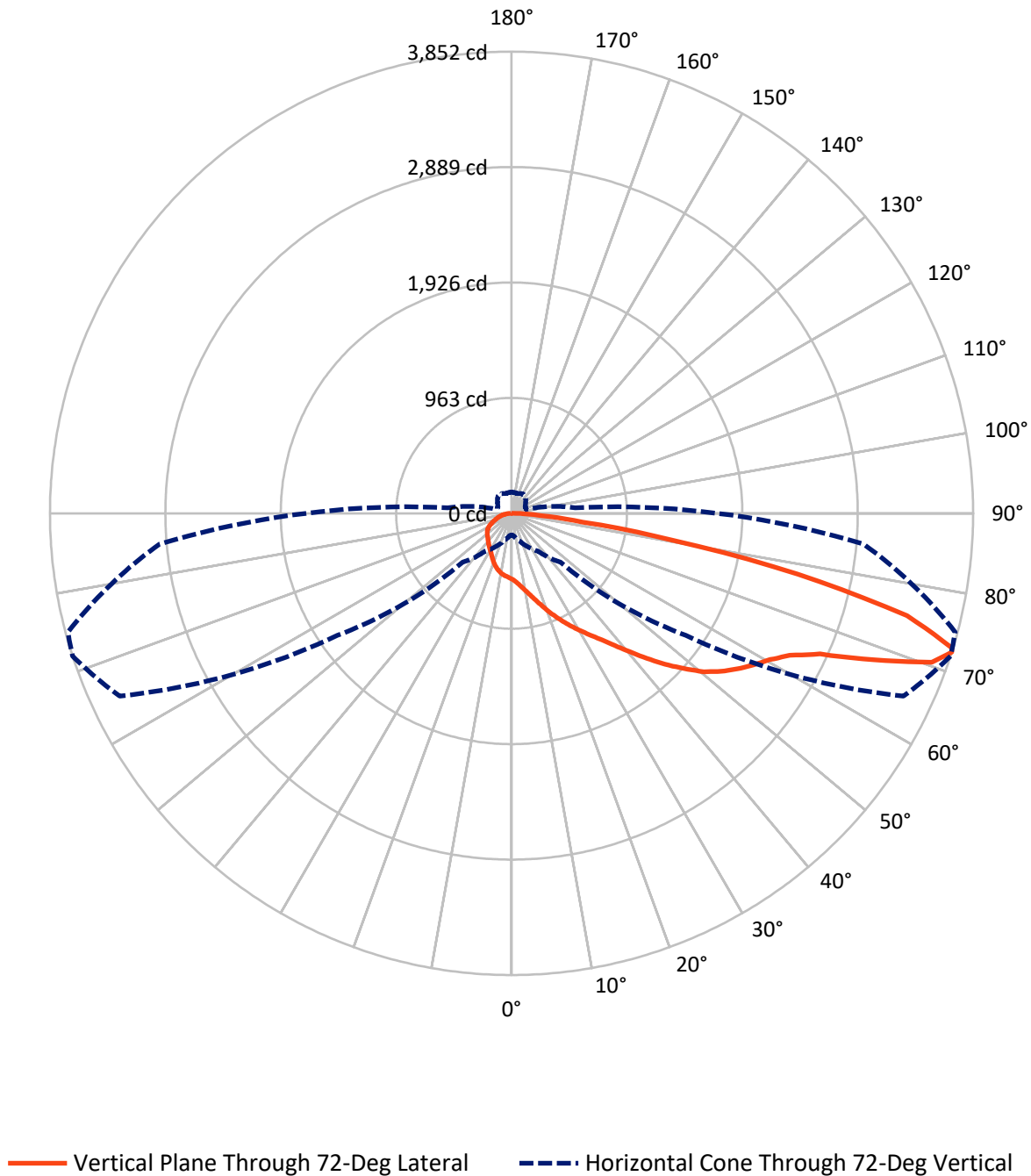
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 1.2 fc  
 Type III - Medium - N/A

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## Luminous Intensity Polar Plot



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CATALOG NUMBER: GLEON-SA1A-735-U-T2

**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 827.2    | 0.0    | 827.2  |
|                    | % Fixture | 18.6     | 0.0    | 18.6   |
| <b>Street Side</b> | Lumens    | 3632.1   | 0.0    | 3632.1 |
|                    | % Fixture | 81.4     | 0.0    | 81.4   |
| <b>Total</b>       | Lumens    | 4459.3   | 0.0    | 4459.3 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 55.0   | 1.2       |
| 10°-20°   | 177.6  | 4.0       |
| 20°-30°   | 311.3  | 7.0       |
| 30°-40°   | 461.5  | 10.4      |
| 40°-50°   | 675.0  | 15.1      |
| 50°-60°   | 928.9  | 20.8      |
| 60°-70°   | 1034.1 | 23.2      |
| 70°-80°   | 700.7  | 15.7      |
| 80°-90°   | 115.2  | 2.6       |
| 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°    | 4459.3 | 100.0     |
| 0°-180°   | 4459.3 | 100.0     |

**Coefficient of Utilization**



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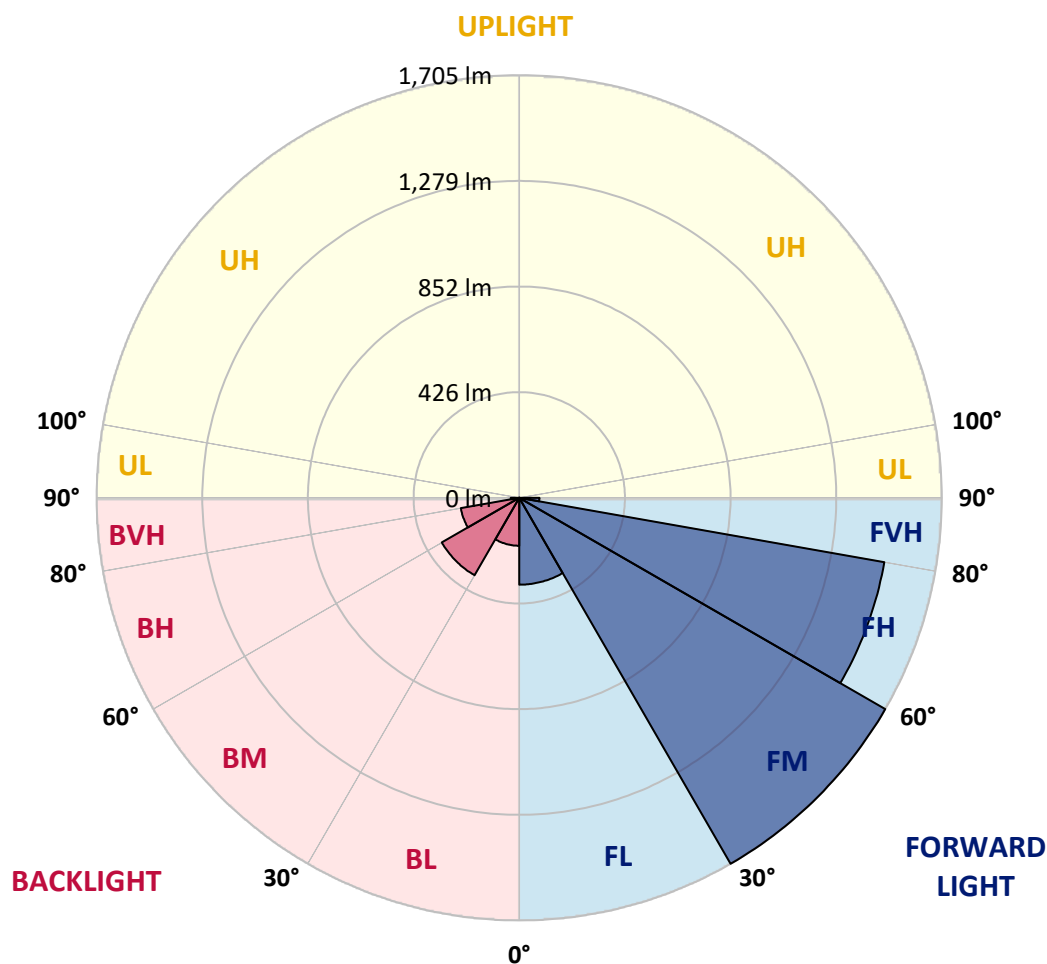
CATALOG NUMBER: GLEON-SA1A-735-U-T2

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 350.5  | 7.9       |                         |      |         |
| FM   | (30°-60°)   | 1704.8 | 38.2      |                         |      |         |
| FH   | (60°-80°)   | 1495.5 | 33.5      |                         |      | G1/1800 |
| FVH  | (80°-90°)   | 81.2   | 1.8       |                         |      | G1/100  |
| BL   | (0°-30°)    | 193.4  | 4.3       | B1/500                  |      |         |
| BM   | (30°-60°)   | 360.6  | 8.1       | B1/1000                 |      |         |
| BH   | (60°-80°)   | 239.3  | 5.4       | B1/500                  |      | G1/500  |
| BVH  | (80°-90°)   | 33.9   | 0.8       |                         |      | G1/100  |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B1-U0-G1**

Type III Medium



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 65°    | 72°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 548.6  | 548.6  | 548.6  | 548.6  | 548.6  | 548.6  | 548.6  | 548.6  | 548.6  | 548.6  | 548.6  |
| 2.5°  | 606.1  | 605.1  | 601.9  | 601.9  | 595.7  | 590.5  | 580.7  | 574.1  | 566.3  | 563.5  | 554.3  |
| 5°    | 664.7  | 665.0  | 661.0  | 658.2  | 649.2  | 638.1  | 621.4  | 606.2  | 591.0  | 584.8  | 566.0  |
| 7.5°  | 713.9  | 713.4  | 712.3  | 710.0  | 701.5  | 690.2  | 667.6  | 645.0  | 622.6  | 613.4  | 580.8  |
| 10°   | 745.6  | 747.0  | 747.9  | 749.0  | 745.4  | 737.3  | 716.0  | 688.5  | 659.2  | 646.6  | 598.7  |
| 12.5° | 761.5  | 764.1  | 768.3  | 775.7  | 781.6  | 780.6  | 765.1  | 735.9  | 701.1  | 685.2  | 621.0  |
| 15°   | 770.9  | 774.2  | 780.9  | 794.1  | 810.5  | 819.9  | 815.8  | 789.4  | 750.5  | 731.0  | 648.1  |
| 17.5° | 776.8  | 779.4  | 789.9  | 807.5  | 831.9  | 856.7  | 867.6  | 845.6  | 806.4  | 784.2  | 679.3  |
| 20°   | 780.7  | 782.8  | 795.8  | 816.5  | 848.2  | 887.8  | 918.2  | 912.6  | 868.0  | 839.1  | 711.8  |
| 22.5° | 789.7  | 791.3  | 803.8  | 824.7  | 859.7  | 910.9  | 966.9  | 975.1  | 932.9  | 900.2  | 746.7  |
| 25°   | 814.5  | 814.5  | 825.0  | 839.6  | 872.4  | 930.8  | 1008.0 | 1044.7 | 999.3  | 961.2  | 779.0  |
| 27.5° | 862.0  | 861.5  | 865.4  | 870.4  | 895.3  | 951.0  | 1044.7 | 1106.1 | 1068.0 | 1026.5 | 810.3  |
| 30°   | 918.2  | 921.3  | 921.8  | 919.3  | 930.9  | 976.4  | 1078.6 | 1171.0 | 1137.3 | 1092.4 | 842.3  |
| 32.5° | 990.5  | 992.5  | 990.2  | 982.0  | 980.4  | 1012.3 | 1112.0 | 1238.8 | 1212.2 | 1161.4 | 871.6  |
| 35°   | 1082.4 | 1078.5 | 1071.3 | 1054.7 | 1038.9 | 1060.4 | 1150.1 | 1306.7 | 1296.3 | 1244.8 | 912.1  |
| 37.5° | 1180.7 | 1180.9 | 1172.0 | 1134.3 | 1112.5 | 1121.8 | 1202.5 | 1383.6 | 1398.2 | 1343.9 | 963.8  |
| 40°   | 1259.6 | 1263.8 | 1269.3 | 1219.9 | 1191.6 | 1204.4 | 1269.3 | 1472.8 | 1518.5 | 1461.6 | 1031.2 |
| 42.5° | 1314.8 | 1319.5 | 1335.2 | 1304.2 | 1274.9 | 1298.5 | 1347.9 | 1568.0 | 1653.7 | 1597.3 | 1110.1 |
| 45°   | 1373.1 | 1375.7 | 1386.8 | 1373.5 | 1354.7 | 1408.0 | 1436.5 | 1666.5 | 1796.6 | 1742.0 | 1198.4 |
| 47.5° | 1434.6 | 1437.3 | 1448.6 | 1439.8 | 1429.9 | 1510.2 | 1528.9 | 1759.4 | 1933.6 | 1900.9 | 1292.7 |
| 50°   | 1510.4 | 1512.3 | 1523.0 | 1506.9 | 1509.9 | 1587.4 | 1611.6 | 1844.7 | 2077.2 | 2043.6 | 1387.3 |
| 52.5° | 1613.9 | 1614.4 | 1629.3 | 1614.7 | 1600.2 | 1643.8 | 1682.7 | 1924.9 | 2189.7 | 2173.9 | 1481.8 |
| 55°   | 1695.0 | 1699.9 | 1748.7 | 1745.6 | 1737.3 | 1695.1 | 1742.1 | 2001.4 | 2290.1 | 2297.7 | 1582.2 |
| 57.5° | 1643.2 | 1662.4 | 1761.3 | 1831.0 | 1898.9 | 1822.8 | 1822.4 | 2087.6 | 2383.5 | 2419.0 | 1692.6 |
| 60°   | 1439.1 | 1465.2 | 1611.0 | 1765.6 | 1978.0 | 2044.7 | 1989.1 | 2192.8 | 2477.7 | 2539.5 | 1831.0 |
| 62.5° | 1027.9 | 1070.8 | 1268.3 | 1515.2 | 1869.5 | 2191.8 | 2328.5 | 2359.7 | 2605.9 | 2678.9 | 2010.8 |
| 65°   | 519.6  | 552.1  | 717.7  | 1015.1 | 1493.6 | 2095.7 | 2697.3 | 2725.1 | 2828.7 | 2893.6 | 2287.7 |
| 67.5° | 315.7  | 328.0  | 408.8  | 564.6  | 915.7  | 1632.4 | 2817.7 | 3334.2 | 3259.9 | 3294.3 | 2682.4 |
| 70°   | 232.6  | 241.6  | 292.0  | 374.9  | 526.7  | 958.0  | 2448.3 | 3768.9 | 3720.0 | 3716.2 | 2974.2 |
| 72°   | 181.2  | 187.8  | 232.3  | 302.9  | 385.1  | 574.7  | 1774.5 | 3608.4 | 3851.8 | 3832.5 | 2947.4 |
| 72.5° | 171.8  | 177.6  | 218.2  | 285.1  | 363.9  | 521.0  | 1595.5 | 3500.2 | 3842.3 | 3833.5 | 2912.9 |
| 75°   | 135.3  | 139.5  | 161.5  | 220.5  | 284.9  | 295.6  | 874.3  | 2712.5 | 3408.5 | 3550.2 | 2619.9 |
| 77.5° | 112.0  | 112.5  | 124.2  | 160.4  | 222.0  | 208.9  | 429.4  | 1882.0 | 2440.7 | 2596.6 | 1855.9 |
| 80°   | 91.2   | 91.9   | 97.5   | 112.5  | 168.0  | 154.6  | 203.9  | 1082.2 | 1366.6 | 1368.3 | 882.5  |
| 82.5° | 72.7   | 72.8   | 78.9   | 82.3   | 120.7  | 110.6  | 116.8  | 508.1  | 597.1  | 574.4  | 317.2  |
| 85°   | 51.1   | 50.0   | 77.0   | 67.5   | 78.9   | 70.9   | 64.5   | 201.1  | 246.9  | 236.1  | 99.3   |
| 87.5° | 17.0   | 17.7   | 34.3   | 43.8   | 46.0   | 40.2   | 28.7   | 77.0   | 93.2   | 92.4   | 31.5   |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |



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CATALOG NUMBER: GLEON-SA1A-735-U-T2

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°   | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 548.6  | 548.6 | 548.6 | 548.6 | 548.6 | 548.6 | 548.6 | 548.6 | 548.6 | 548.6 | 548.6 |
| 2.5°  | 551.4  | 546.4 | 539.3 | 531.3 | 524.9 | 518.5 | 513.7 | 511.3 | 508.5 | 506.2 | 509.0 |
| 5°    | 557.3  | 548.0 | 532.7 | 517.6 | 506.6 | 496.7 | 489.6 | 486.0 | 482.6 | 480.3 | 480.6 |
| 7.5°  | 566.8  | 551.8 | 526.0 | 504.1 | 488.7 | 478.2 | 470.9 | 468.5 | 466.3 | 465.7 | 466.4 |
| 10°   | 576.9  | 554.9 | 517.3 | 488.1 | 470.6 | 461.9 | 458.6 | 460.4 | 461.9 | 463.3 | 464.7 |
| 12.5° | 588.4  | 557.7 | 504.5 | 469.4 | 454.5 | 451.1 | 454.3 | 461.7 | 467.1 | 470.3 | 472.3 |
| 15°   | 603.5  | 560.1 | 489.8 | 450.7 | 440.7 | 444.5 | 455.4 | 468.2 | 477.5 | 483.5 | 484.4 |
| 17.5° | 617.2  | 560.0 | 470.9 | 431.8 | 429.4 | 440.7 | 457.1 | 475.1 | 487.7 | 496.1 | 497.8 |
| 20°   | 631.5  | 555.9 | 449.0 | 413.3 | 418.1 | 436.5 | 457.9 | 479.6 | 494.7 | 504.5 | 506.9 |
| 22.5° | 644.9  | 548.6 | 424.9 | 396.6 | 408.6 | 431.0 | 455.0 | 477.0 | 492.1 | 500.1 | 502.6 |
| 25°   | 653.9  | 536.0 | 400.5 | 382.5 | 400.1 | 424.2 | 445.5 | 463.1 | 474.4 | 478.4 | 479.1 |
| 27.5° | 658.5  | 519.6 | 377.4 | 370.2 | 391.3 | 413.1 | 427.8 | 436.5 | 439.8 | 439.4 | 438.9 |
| 30°   | 659.2  | 497.9 | 357.6 | 360.2 | 381.3 | 396.9 | 403.8 | 402.1 | 398.0 | 390.9 | 391.5 |
| 32.5° | 657.2  | 473.5 | 341.0 | 350.7 | 368.3 | 377.1 | 377.4 | 369.3 | 358.2 | 347.0 | 343.9 |
| 35°   | 657.8  | 449.6 | 326.4 | 339.9 | 352.7 | 356.5 | 353.0 | 341.0 | 325.9 | 311.5 | 308.4 |
| 37.5° | 664.6  | 428.7 | 313.8 | 327.5 | 335.4 | 336.3 | 331.2 | 318.6 | 307.5 | 293.4 | 292.2 |
| 40°   | 680.7  | 413.8 | 301.8 | 313.6 | 318.0 | 318.5 | 311.2 | 302.3 | 303.2 | 295.8 | 295.6 |
| 42.5° | 709.7  | 407.4 | 291.3 | 298.9 | 301.7 | 302.7 | 297.1 | 291.4 | 299.4 | 294.5 | 292.8 |
| 45°   | 747.1  | 408.9 | 282.4 | 284.7 | 289.7 | 294.0 | 290.6 | 283.7 | 286.8 | 265.5 | 258.4 |
| 47.5° | 790.4  | 418.7 | 275.3 | 272.4 | 281.1 | 289.2 | 284.0 | 273.6 | 262.7 | 241.6 | 237.5 |
| 50°   | 841.1  | 433.9 | 268.8 | 260.3 | 271.7 | 282.8 | 277.6 | 262.7 | 246.3 | 236.0 | 234.7 |
| 52.5° | 893.9  | 452.5 | 262.4 | 246.9 | 260.0 | 277.9 | 275.3 | 260.3 | 240.0 | 229.8 | 228.0 |
| 55°   | 953.8  | 471.3 | 254.3 | 231.4 | 247.2 | 275.6 | 274.2 | 251.3 | 235.2 | 229.5 | 228.1 |
| 57.5° | 1028.2 | 492.6 | 243.5 | 215.3 | 235.2 | 267.4 | 263.0 | 246.0 | 230.3 | 226.0 | 225.5 |
| 60°   | 1125.3 | 524.1 | 228.0 | 198.0 | 220.7 | 254.6 | 253.7 | 238.1 | 222.5 | 219.4 | 218.8 |
| 62.5° | 1270.9 | 576.1 | 206.7 | 180.9 | 204.4 | 232.9 | 241.4 | 227.6 | 214.2 | 214.1 | 214.3 |
| 65°   | 1496.6 | 654.4 | 183.5 | 165.8 | 187.9 | 214.6 | 227.1 | 216.7 | 205.8 | 208.9 | 209.3 |
| 67.5° | 1758.2 | 719.3 | 160.8 | 151.1 | 171.2 | 197.3 | 214.2 | 205.8 | 194.5 | 202.5 | 202.7 |
| 70°   | 1845.3 | 661.3 | 140.8 | 136.5 | 153.9 | 180.5 | 200.2 | 193.8 | 182.4 | 190.4 | 189.7 |
| 72°   | 1717.2 | 533.9 | 127.9 | 125.5 | 140.8 | 166.7 | 187.8 | 182.6 | 171.3 | 176.7 | 174.8 |
| 72.5° | 1676.9 | 509.0 | 124.6 | 122.7 | 137.3 | 163.2 | 184.5 | 179.8 | 168.6 | 173.2 | 171.3 |
| 75°   | 1495.8 | 442.0 | 107.1 | 107.6 | 119.8 | 146.1 | 166.5 | 164.9 | 153.4 | 153.9 | 153.2 |
| 77.5° | 1085.0 | 324.1 | 90.3  | 93.3  | 101.9 | 128.4 | 148.2 | 147.3 | 134.7 | 132.4 | 131.9 |
| 80°   | 503.5  | 165.3 | 73.6  | 74.9  | 83.8  | 107.3 | 126.4 | 125.1 | 115.0 | 112.1 | 110.4 |
| 82.5° | 172.4  | 78.6  | 55.2  | 56.2  | 64.9  | 86.4  | 109.6 | 108.9 | 100.4 | 94.7  | 91.2  |
| 85°   | 61.6   | 39.1  | 38.7  | 37.7  | 46.4  | 68.0  | 95.5  | 91.4  | 78.9  | 67.3  | 67.0  |
| 87.5° | 19.9   | 16.8  | 19.9  | 19.8  | 27.0  | 46.0  | 69.4  | 59.2  | 57.3  | 47.6  | 46.7  |
| 90°   | 0.0    | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |



LM-79-08: Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Report Prepared for

Cooper Lighting Solutions

All Brands

Data applicable to all product families using SA light engines

Report Number: SP1-2101-121-7

Luminaire Tested: IFLD-S-SA2A-735-U-T2

Test Date: 03/04/2021

### Test Information

Test Method: LM-79-08  
 Report Number: SP1-2101-121-7  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1  
 Measurement Geometry:  $4\pi$   
 Issue Date: 03/04/2021  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: STREETWORKS  
 Catalog Number: **IFLD-S-SA2A-735-U-T2**  
 Description: STREETWORKS INF FLOOD

PROGRAMMED @ 615mA.

### Spectral Parameters

|                           |        |           |      |      |       |
|---------------------------|--------|-----------|------|------|-------|
| CCT (K):                  | 3388   | CRI (Ra): | 73.1 |      |       |
| CIE u':                   | 0.2371 | R1:       | 68.9 | R9:  | -34.6 |
| CIE v':                   | 0.5177 | R2:       | 81.1 | R10: | 57.8  |
| Duv:                      | 0.0032 | R3:       | 93.1 | R11: | 68.6  |
| CIE x:                    | 0.4153 | R4:       | 71.6 | R12: | 53.9  |
| CIE y:                    | 0.4030 | R5:       | 69.4 | R13: | 70.9  |
| CIE z:                    | 0.1817 | R6:       | 75.0 | R14: | 96.2  |
| Peak Wavelength (nm):     | 590    | R7:       | 79.5 |      |       |
| Dominant Wavelength (nm): | 580    | R8:       | 46.4 |      |       |
| Purity:                   | 45.7   |           |      |      |       |
| Rf:                       | 76.9   |           |      |      |       |
| Rg:                       | 94.4   |           |      |      |       |



### Test Conditions

Stabilization Time: 81M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 25.0/30%  
 Sphere Temperature (°C): 24.1

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| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | IN0058                | 1/31/2021        | 7/31/2021            |
| Power Meter                    | IN0071                | 12/1/2020        | 12/1/2021            |
| AC Power Source                | IN0063                | 12/1/2020        | 12/1/2021            |
| DC Power Source                | IN0208                | 12/1/2020        | 12/1/2021            |
| Sphere Thermometer             | IN0085                | 12/1/2020        | 12/1/2021            |
| Room Thermometer               | IN0046                | 12/1/2020        | 12/1/2021            |

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**CIE 1931 Chromaticity Diagram**



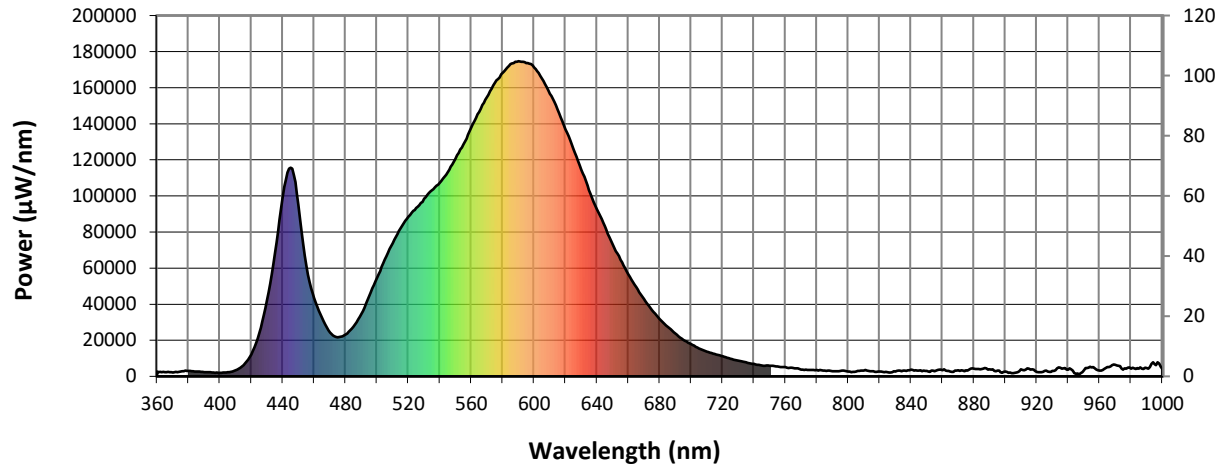
**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 3500K 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       | 2672             | 0.0              | 490       | 34553            | 4.9              | 620       | 136720           | 35.6             | 750       | 5870             | 0.0              | 880       | 4216             | 0.0              |
| 365       | 2252             | 0.0              | 495       | 44336            | 8.0              | 625       | 126308           | 27.9             | 755       | 5421             | 0.0              | 885       | 4132             | 0.0              |
| 370       | 2217             | 0.0              | 500       | 54643            | 12.1             | 630       | 114625           | 20.7             | 760       | 5097             | 0.0              | 890       | 3992             | 0.0              |
| 375       | 2697             | 0.0              | 505       | 64676            | 18.1             | 635       | 103216           | 15.5             | 765       | 4626             | 0.0              | 895       | 3214             | 0.0              |
| 380       | 3039             | 0.0              | 510       | 73825            | 25.4             | 640       | 92605            | 11.1             | 770       | 3782             | 0.0              | 900       | 2580             | 0.0              |
| 385       | 2655             | 0.0              | 515       | 81872            | 33.9             | 645       | 83234            | 8.0              | 775       | 3506             | 0.0              | 905       | 1776             | 0.0              |
| 390       | 2357             | 0.0              | 520       | 88574            | 43.0             | 650       | 73263            | 5.4              | 780       | 3507             | 0.0              | 910       | 3995             | 0.0              |
| 395       | 2186             | 0.0              | 525       | 93289            | 50.1             | 655       | 64627            | 3.7              | 785       | 3267             | 0.0              | 915       | 4288             | 0.0              |
| 400       | 2015             | 0.0              | 530       | 98393            | 57.9             | 660       | 56614            | 2.4              | 790       | 2849             | 0.0              | 920       | 2446             | 0.0              |
| 405       | 2234             | 0.0              | 535       | 103269           | 64.0             | 665       | 49537            | 1.6              | 795       | 3037             | 0.0              | 925       | 3009             | 0.0              |
| 410       | 3412             | 0.0              | 540       | 107316           | 69.9             | 670       | 42866            | 0.9              | 800       | 2716             | 0.0              | 930       | 3026             | 0.0              |
| 415       | 6135             | 0.0              | 545       | 113101           | 75.3             | 675       | 36708            | 0.6              | 805       | 2648             | 0.0              | 935       | 4734             | 0.0              |
| 420       | 12146            | 0.0              | 550       | 120690           | 82.0             | 680       | 31814            | 0.4              | 810       | 3187             | 0.0              | 940       | 3719             | 0.0              |
| 425       | 23983            | 0.1              | 555       | 128583           | 87.8             | 685       | 27485            | 0.2              | 815       | 2931             | 0.0              | 945       | 1480             | 0.0              |
| 430       | 42142            | 0.3              | 560       | 137796           | 93.6             | 690       | 23698            | 0.1              | 820       | 2717             | 0.0              | 950       | 3450             | 0.0              |
| 435       | 68228            | 0.8              | 565       | 146577           | 97.5             | 695       | 20309            | 0.1              | 825       | 2236             | 0.0              | 955       | 5051             | 0.0              |
| 440       | 99323            | 1.6              | 570       | 154581           | 100.5            | 700       | 17890            | 0.1              | 830       | 2628             | 0.0              | 960       | 3176             | 0.0              |
| 445       | 115584           | 2.4              | 575       | 162633           | 101.2            | 705       | 15500            | 0.0              | 835       | 3140             | 0.0              | 965       | 5178             | 0.0              |
| 450       | 94997            | 2.5              | 580       | 168101           | 99.9             | 710       | 13699            | 0.0              | 840       | 3675             | 0.0              | 970       | 6385             | 0.0              |
| 455       | 61433            | 2.1              | 585       | 173145           | 96.2             | 715       | 12398            | 0.0              | 845       | 3283             | 0.0              | 975       | 3810             | 0.0              |
| 460       | 43373            | 1.8              | 590       | 174675           | 90.3             | 720       | 11147            | 0.0              | 850       | 3055             | 0.0              | 980       | 4322             | 0.0              |
| 465       | 32472            | 1.7              | 595       | 173724           | 82.3             | 725       | 9761             | 0.0              | 855       | 2932             | 0.0              | 985       | 4200             | 0.0              |
| 470       | 24257            | 1.5              | 600       | 171241           | 73.8             | 730       | 8651             | 0.0              | 860       | 3382             | 0.0              | 990       | 4661             | 0.0              |
| 475       | 21690            | 1.7              | 605       | 165134           | 64.0             | 735       | 7730             | 0.0              | 865       | 2605             | 0.0              | 995       | 6746             | 0.0              |
| 480       | 23173            | 2.2              | 610       | 156652           | 53.8             | 740       | 6847             | 0.0              | 870       | 3325             | 0.0              | 1000      | 4150             | 0.0              |
| 485       | 27564            | 3.3              | 615       | 147879           | 44.6             | 745       | 6124             | 0.0              | 875       | 3325             | 0.0              |           |                  |                  |

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### Scotopic Flux vs. Wavelength



Scotopic Lumens: 12126

S/P: 1.36

| 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       | 2672             | 0.0              | 490       | 34553            | 53.2             | 620       | 136720           | 1.7              | 750       | 5870             | 0.0              | 880       | 4216             | 0.0              |
| 365       | 2252             | 0.0              | 495       | 44336            | 71.7             | 625       | 126308           | 1.1              | 755       | 5421             | 0.0              | 885       | 4132             | 0.0              |
| 370       | 2217             | 0.0              | 500       | 54643            | 91.4             | 630       | 114625           | 0.6              | 760       | 5097             | 0.0              | 890       | 3992             | 0.0              |
| 375       | 2697             | 0.0              | 505       | 64676            | 110.0            | 635       | 103216           | 0.4              | 765       | 4626             | 0.0              | 895       | 3214             | 0.0              |
| 380       | 3039             | 0.0              | 510       | 73825            | 125.1            | 640       | 92605            | 0.2              | 770       | 3782             | 0.0              | 900       | 2580             | 0.0              |
| 385       | 2655             | 0.0              | 515       | 81872            | 135.7            | 645       | 83234            | 0.1              | 775       | 3506             | 0.0              | 905       | 1776             | 0.0              |
| 390       | 2357             | 0.0              | 520       | 88574            | 140.8            | 650       | 73263            | 0.1              | 780       | 3507             | 0.0              | 910       | 3995             | 0.0              |
| 395       | 2186             | 0.0              | 525       | 93289            | 139.6            | 655       | 64627            | 0.1              | 785       | 3267             | 0.0              | 915       | 4288             | 0.0              |
| 400       | 2015             | 0.0              | 530       | 98393            | 135.7            | 660       | 56614            | 0.0              | 790       | 2849             | 0.0              | 920       | 2446             | 0.0              |
| 405       | 2234             | 0.1              | 535       | 103269           | 128.7            | 665       | 49537            | 0.0              | 795       | 3037             | 0.0              | 925       | 3009             | 0.0              |
| 410       | 3412             | 0.2              | 540       | 107316           | 118.6            | 670       | 42866            | 0.0              | 800       | 2716             | 0.0              | 930       | 3026             | 0.0              |
| 415       | 6135             | 0.6              | 545       | 113101           | 108.4            | 675       | 36708            | 0.0              | 805       | 2648             | 0.0              | 935       | 4734             | 0.0              |
| 420       | 12146            | 2.0              | 550       | 120690           | 98.7             | 680       | 31814            | 0.0              | 810       | 3187             | 0.0              | 940       | 3719             | 0.0              |
| 425       | 23983            | 5.9              | 555       | 128583           | 87.9             | 685       | 27485            | 0.0              | 815       | 2931             | 0.0              | 945       | 1480             | 0.0              |
| 430       | 42142            | 14.3             | 560       | 137796           | 77.0             | 690       | 23698            | 0.0              | 820       | 2717             | 0.0              | 950       | 3450             | 0.0              |
| 435       | 68228            | 30.5             | 565       | 146577           | 65.8             | 695       | 20309            | 0.0              | 825       | 2236             | 0.0              | 955       | 5051             | 0.0              |
| 440       | 99323            | 55.5             | 570       | 154581           | 54.6             | 700       | 17890            | 0.0              | 830       | 2628             | 0.0              | 960       | 3176             | 0.0              |
| 445       | 115584           | 77.4             | 575       | 162633           | 44.3             | 705       | 15500            | 0.0              | 835       | 3140             | 0.0              | 965       | 5178             | 0.0              |
| 450       | 94997            | 73.6             | 580       | 168101           | 34.6             | 710       | 13699            | 0.0              | 840       | 3675             | 0.0              | 970       | 6385             | 0.0              |
| 455       | 61433            | 53.7             | 585       | 173145           | 26.5             | 715       | 12398            | 0.0              | 845       | 3283             | 0.0              | 975       | 3810             | 0.0              |
| 460       | 43373            | 41.9             | 590       | 174675           | 19.5             | 720       | 11147            | 0.0              | 850       | 3055             | 0.0              | 980       | 4322             | 0.0              |
| 465       | 32472            | 34.3             | 595       | 173724           | 13.9             | 725       | 9761             | 0.0              | 855       | 2932             | 0.0              | 985       | 4200             | 0.0              |
| 470       | 24257            | 27.9             | 600       | 171241           | 9.7              | 730       | 8651             | 0.0              | 860       | 3382             | 0.0              | 990       | 4661             | 0.0              |
| 475       | 21690            | 27.1             | 605       | 165134           | 6.5              | 735       | 7730             | 0.0              | 865       | 2605             | 0.0              | 995       | 6746             | 0.0              |
| 480       | 23173            | 31.3             | 610       | 156652           | 4.2              | 740       | 6847             | 0.0              | 870       | 3325             | 0.0              | 1000      | 4150             | 0.0              |
| 485       | 27564            | 40.0             | 615       | 147879           | 2.7              | 745       | 6124             | 0.0              | 875       | 3325             | 0.0              |           |                  |                  |

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### Melanopic Flux vs. Wavelength


**Melanopic Lumens: 4490.7**
**M/P: 0.5**

| 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       | 2672             | 0.0              | 490       | 34553            | 28.8             | 620       | 136720           | 0.1              | 750       | 5870             | 0.0              | 880       | 4216             | 0.0              |
| 365       | 2252             | 0.0              | 495       | 44336            | 36.6             | 625       | 126308           | 0.1              | 755       | 5421             | 0.0              | 885       | 4132             | 0.0              |
| 370       | 2217             | 0.0              | 500       | 54643            | 43.9             | 630       | 114625           | 0.0              | 760       | 5097             | 0.0              | 890       | 3992             | 0.0              |
| 375       | 2697             | 0.0              | 505       | 64676            | 49.6             | 635       | 103216           | 0.0              | 765       | 4626             | 0.0              | 895       | 3214             | 0.0              |
| 380       | 3039             | 0.0              | 510       | 73825            | 53.0             | 640       | 92605            | 0.0              | 770       | 3782             | 0.0              | 900       | 2580             | 0.0              |
| 385       | 2655             | 0.0              | 515       | 81872            | 53.5             | 645       | 83234            | 0.0              | 775       | 3506             | 0.0              | 905       | 1776             | 0.0              |
| 390       | 2357             | 0.0              | 520       | 88574            | 51.6             | 650       | 73263            | 0.0              | 780       | 3507             | 0.0              | 910       | 3995             | 0.0              |
| 395       | 2186             | 0.0              | 525       | 93289            | 47.3             | 655       | 64627            | 0.0              | 785       | 3267             | 0.0              | 915       | 4288             | 0.0              |
| 400       | 2015             | 0.0              | 530       | 98393            | 42.5             | 660       | 56614            | 0.0              | 790       | 2849             | 0.0              | 920       | 2446             | 0.0              |
| 405       | 2234             | 0.0              | 535       | 103269           | 37.2             | 665       | 49537            | 0.0              | 795       | 3037             | 0.0              | 925       | 3009             | 0.0              |
| 410       | 3412             | 0.1              | 540       | 107316           | 31.4             | 670       | 42866            | 0.0              | 800       | 2716             | 0.0              | 930       | 3026             | 0.0              |
| 415       | 6135             | 0.4              | 545       | 113101           | 26.3             | 675       | 36708            | 0.0              | 805       | 2648             | 0.0              | 935       | 4734             | 0.0              |
| 420       | 12146            | 1.4              | 550       | 120690           | 21.7             | 680       | 31814            | 0.0              | 810       | 3187             | 0.0              | 940       | 3719             | 0.0              |
| 425       | 23983            | 3.7              | 555       | 128583           | 17.3             | 685       | 27485            | 0.0              | 815       | 2931             | 0.0              | 945       | 1480             | 0.0              |
| 430       | 42142            | 8.9              | 560       | 137796           | 13.6             | 690       | 23698            | 0.0              | 820       | 2717             | 0.0              | 950       | 3450             | 0.0              |
| 435       | 68228            | 18.2             | 565       | 146577           | 10.3             | 695       | 20309            | 0.0              | 825       | 2236             | 0.0              | 955       | 5051             | 0.0              |
| 440       | 99323            | 33.2             | 570       | 154581           | 7.6              | 700       | 17890            | 0.0              | 830       | 2628             | 0.0              | 960       | 3176             | 0.0              |
| 445       | 115584           | 45.6             | 575       | 162633           | 5.4              | 705       | 15500            | 0.0              | 835       | 3140             | 0.0              | 965       | 5178             | 0.0              |
| 450       | 94997            | 43.8             | 580       | 168101           | 3.8              | 710       | 13699            | 0.0              | 840       | 3675             | 0.0              | 970       | 6385             | 0.0              |
| 455       | 61433            | 32.2             | 585       | 173145           | 2.6              | 715       | 12398            | 0.0              | 845       | 3283             | 0.0              | 975       | 3810             | 0.0              |
| 460       | 43373            | 25.6             | 590       | 174675           | 1.7              | 720       | 11147            | 0.0              | 850       | 3055             | 0.0              | 980       | 4322             | 0.0              |
| 465       | 32472            | 21.2             | 595       | 173724           | 1.1              | 725       | 9761             | 0.0              | 855       | 2932             | 0.0              | 985       | 4200             | 0.0              |
| 470       | 24257            | 17.4             | 600       | 171241           | 0.7              | 730       | 8651             | 0.0              | 860       | 3382             | 0.0              | 990       | 4661             | 0.0              |
| 475       | 21690            | 16.6             | 605       | 165134           | 0.5              | 735       | 7730             | 0.0              | 865       | 2605             | 0.0              | 995       | 6746             | 0.0              |
| 480       | 23173            | 18.6             | 610       | 156652           | 0.3              | 740       | 6847             | 0.0              | 870       | 3325             | 0.0              | 1000      | 4150             | 0.0              |
| 485       | 27564            | 22.7             | 615       | 147879           | 0.2              | 745       | 6124             | 0.0              | 875       | 3325             | 0.0              |           |                  |                  |

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TM-30-18

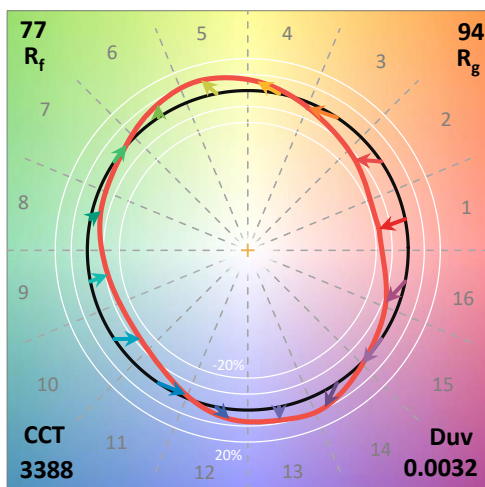
### Summary

$R_f = 76.9$   
 $R_g = 94.4$   
 CIE  $R_a = 73.1$   
 $R_g = -34.6$

### Spectral Power Distribution Comparison



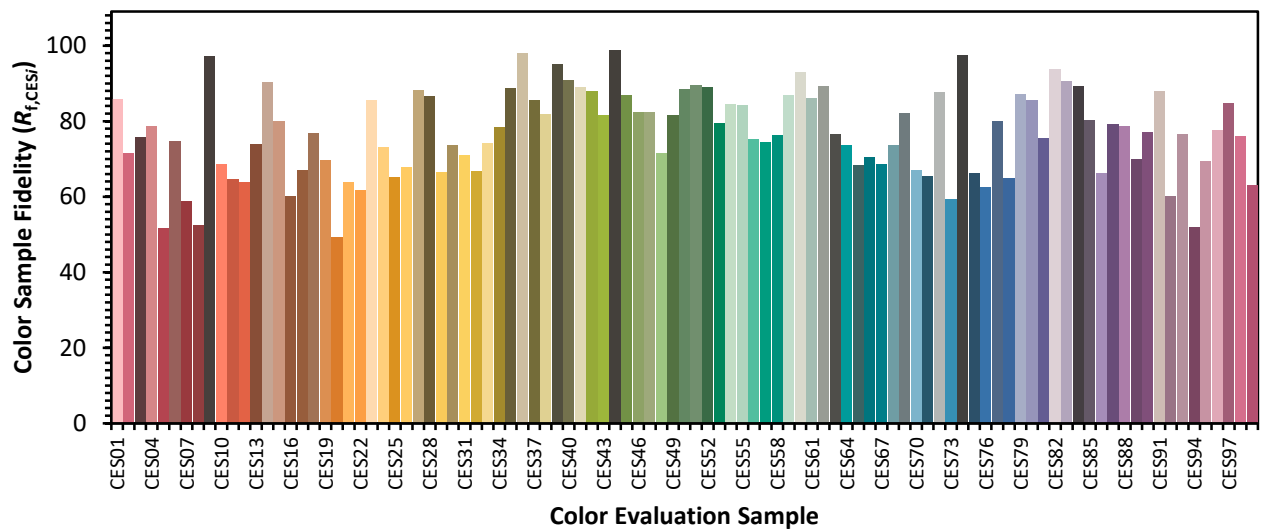
### Color Vector Graphics





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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 68 | CES51 = 90 | CES76 = 63 |
| CES02 = 62 | CES27 = 88 | CES52 = 89 | CES77 = 80 |
| CES03 = 31 | CES28 = 87 | CES53 = 80 | CES78 = 65 |
| CES04 = 70 | CES29 = 67 | CES54 = 84 | CES79 = 87 |
| CES05 = 48 | CES30 = 74 | CES55 = 84 | CES80 = 86 |
| CES06 = 51 | CES31 = 71 | CES56 = 75 | CES81 = 75 |
| CES07 = 40 | CES32 = 67 | CES57 = 74 | CES82 = 94 |
| CES08 = 39 | CES33 = 74 | CES58 = 76 | CES83 = 91 |
| CES09 = 29 | CES34 = 78 | CES59 = 87 | CES84 = 89 |
| CES10 = 75 | CES35 = 89 | CES60 = 93 | CES85 = 80 |
| CES11 = 58 | CES36 = 98 | CES61 = 86 | CES86 = 66 |
| CES12 = 64 | CES37 = 86 | CES62 = 89 | CES87 = 79 |
| CES13 = 43 | CES38 = 82 | CES63 = 77 | CES88 = 79 |
| CES14 = 74 | CES39 = 95 | CES64 = 74 | CES89 = 70 |
| CES15 = 71 | CES40 = 91 | CES65 = 68 | CES90 = 77 |
| CES16 = 47 | CES41 = 89 | CES66 = 71 | CES91 = 88 |
| CES17 = 50 | CES42 = 88 | CES67 = 69 | CES92 = 60 |
| CES18 = 56 | CES43 = 82 | CES68 = 74 | CES93 = 77 |
| CES19 = 72 | CES44 = 99 | CES69 = 82 | CES94 = 52 |
| CES20 = 65 | CES45 = 87 | CES70 = 67 | CES95 = 69 |
| CES21 = 86 | CES46 = 82 | CES71 = 66 | CES96 = 78 |
| CES22 = 79 | CES47 = 82 | CES72 = 88 | CES97 = 85 |
| CES23 = 92 | CES48 = 72 | CES73 = 59 | CES98 = 76 |
| CES24 = 91 | CES49 = 82 | CES74 = 97 | CES99 = 63 |
| CES25 = 72 | CES50 = 88 | CES75 = 66 |            |



Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)