

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: P382718

Luminaire Tested: **GLEON-SA1A-735-U-SL3-HSS**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P382718  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-23)  
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-SL3-HSS  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(1) 70 CRI, 3500K, 615mA LIGHTSQUARE WITH 16 LEDS AND TYPE III SPILL  
LIGHT ELIMINATOR OPTICS WITH HOUSE SIDE SHIELD  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 3883.6 lumens  
Efficiency: N/A  
Efficacy: 114.2 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

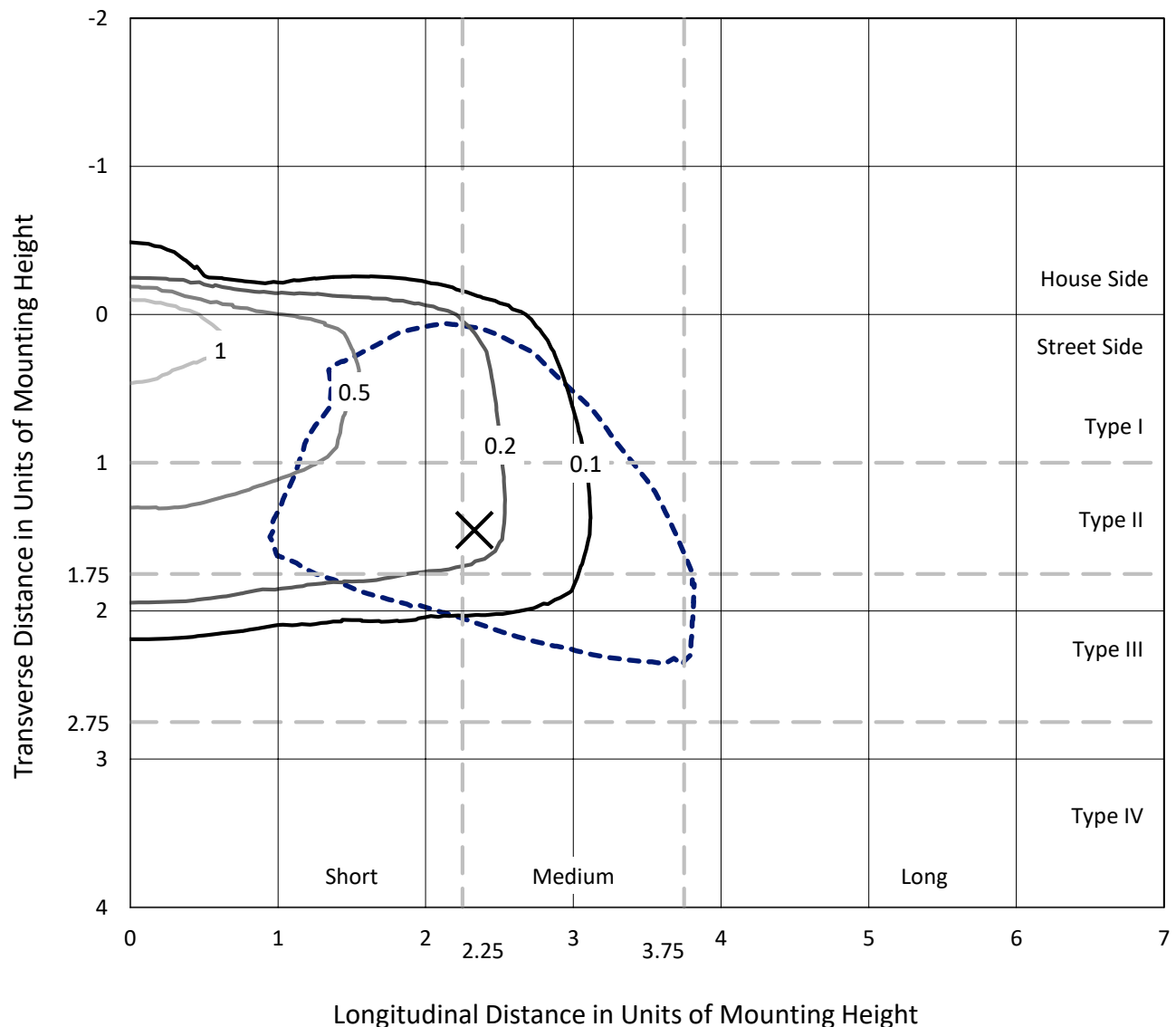
Input Watts (W): 34  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



REPORT NUMBER: P382718  
 CATALOG NUMBER: GLEON-SA1A-735-U-SL3-HSS

## Iso-Footcandle Lines of Horizontal Illumination

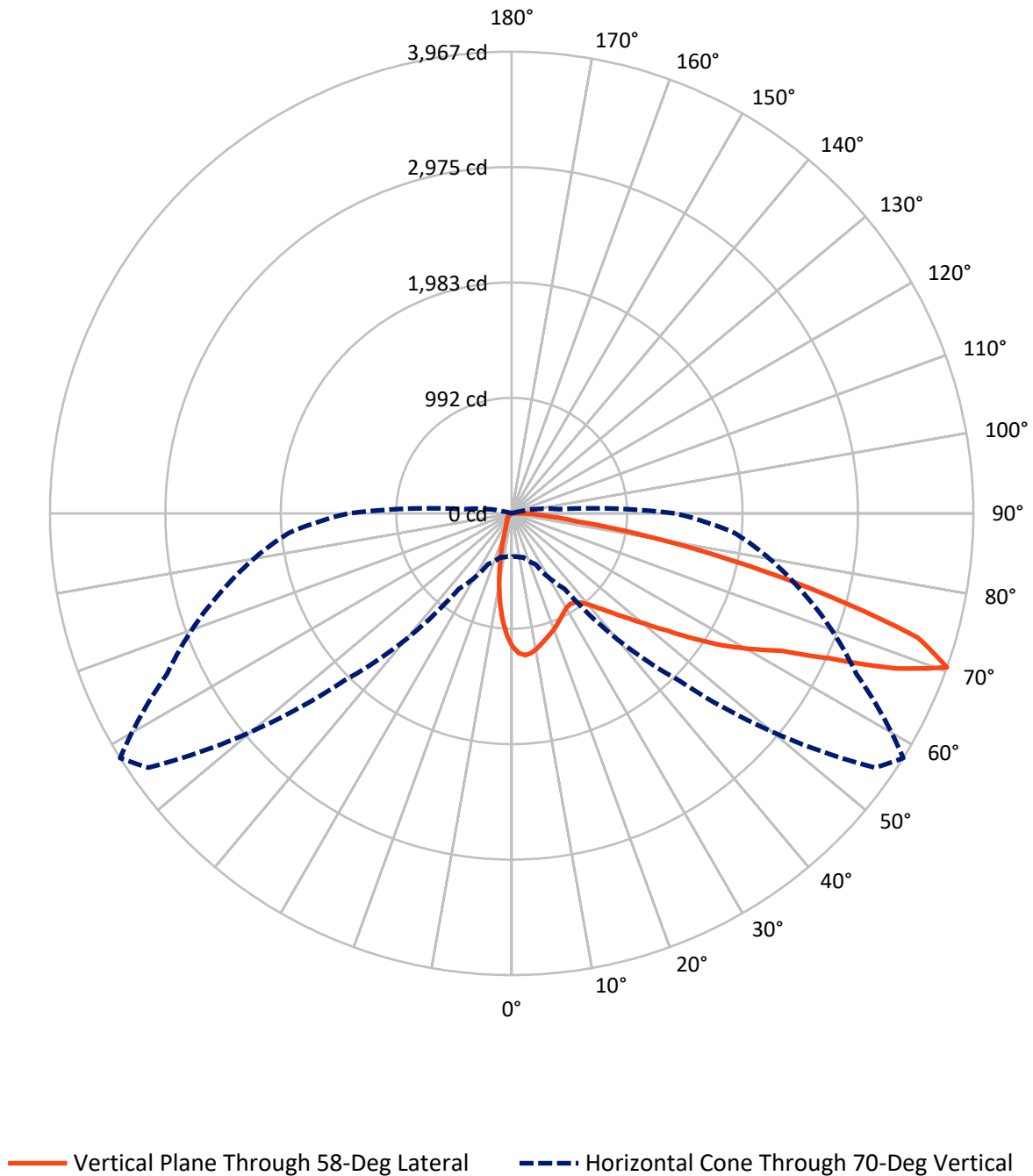
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 1.9 fc  
 Type III - 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    | 332.4    | 0.0    | 332.4  |
|                    | % Fixture | 8.6      | 0.0    | 8.6    |
| <b>Street Side</b> | Lumens    | 3551.3   | 0.0    | 3551.3 |
|                    | % Fixture | 91.4     | 0.0    | 91.4   |
| <b>Total</b>       | Lumens    | 3883.6   | 0.0    | 3883.6 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 93.8   | 2.4       |
| 10°-20°   | 196.9  | 5.1       |
| 20°-30°   | 258.8  | 6.7       |
| 30°-40°   | 342.8  | 8.8       |
| 40°-50°   | 512.4  | 13.2      |
| 50°-60°   | 820.8  | 21.1      |
| 60°-70°   | 1034.6 | 26.6      |
| 70°-80°   | 558.1  | 14.4      |
| 80°-90°   | 65.3   | 1.7       |
| 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°    | 3883.6 | 100.0     |
| 0°-180°   | 3883.6 | 100.0     |

**Coefficient of Utilization**



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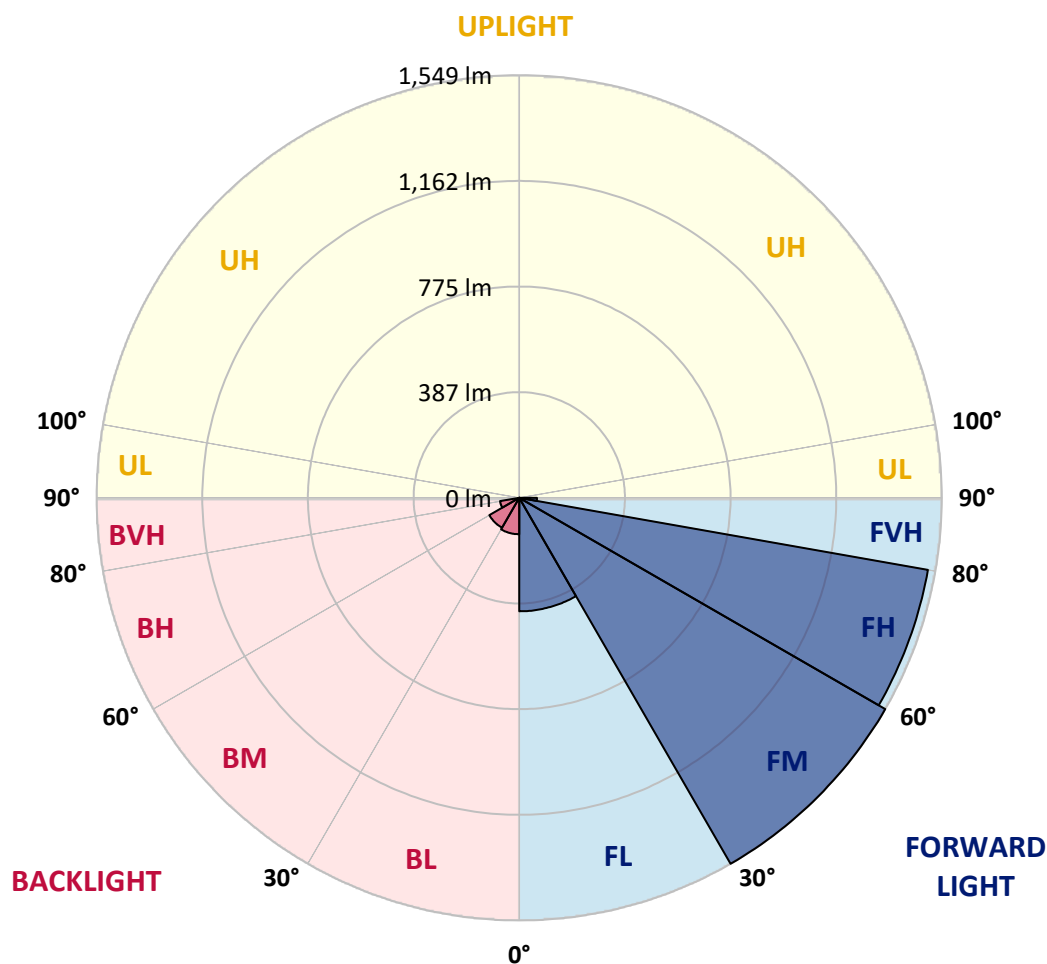
CATALOG NUMBER: GLEON-SA1A-735-U-SL3-HSS

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 416.0  | 10.7      |                         |      |         |
| FM   | (30°-60°)   | 1549.2 | 39.9      |                         |      |         |
| FH   | (60°-80°)   | 1521.3 | 39.2      |                         |      | G1/1800 |
| FVH  | (80°-90°)   | 64.8   | 1.7       |                         |      | G1/100  |
| BL   | (0°-30°)    | 133.5  | 3.4       | B1/500                  |      |         |
| BM   | (30°-60°)   | 126.8  | 3.3       | B0/220                  |      |         |
| BH   | (60°-80°)   | 71.5   | 1.8       | B0/110                  |      | G0/110  |
| BVH  | (80°-90°)   | 0.6    | 0.0       |                         |      | G0/10   |
| 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°    | 58°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1147.2 | 1147.2 | 1147.2 | 1147.2 | 1147.2 | 1147.2 | 1147.2 | 1147.2 | 1147.2 | 1147.2 | 1147.2 |
| 2.5°  | 1242.3 | 1239.2 | 1238.1 | 1236.2 | 1228.7 | 1221.4 | 1207.1 | 1203.1 | 1194.1 | 1172.5 | 1149.8 |
| 5°    | 1243.2 | 1243.2 | 1246.5 | 1245.7 | 1243.2 | 1239.7 | 1229.4 | 1224.1 | 1208.8 | 1178.0 | 1136.4 |
| 7.5°  | 1183.3 | 1186.4 | 1194.1 | 1200.2 | 1207.3 | 1216.5 | 1217.8 | 1212.6 | 1200.0 | 1166.9 | 1111.7 |
| 10°   | 1103.0 | 1107.8 | 1118.4 | 1130.5 | 1149.2 | 1167.5 | 1184.0 | 1183.3 | 1179.1 | 1146.4 | 1082.0 |
| 12.5° | 1022.4 | 1028.1 | 1040.3 | 1058.2 | 1084.5 | 1114.6 | 1143.9 | 1148.0 | 1155.3 | 1128.0 | 1054.5 |
| 15°   | 951.8  | 956.6  | 968.7  | 990.7  | 1023.3 | 1063.7 | 1106.9 | 1114.2 | 1132.9 | 1113.6 | 1031.6 |
| 17.5° | 891.9  | 894.9  | 903.9  | 928.2  | 966.0  | 1014.9 | 1071.0 | 1085.5 | 1113.5 | 1102.3 | 1011.8 |
| 20°   | 850.0  | 850.6  | 856.4  | 873.5  | 911.2  | 966.0  | 1033.8 | 1054.7 | 1092.8 | 1092.6 | 991.2  |
| 22.5° | 829.4  | 827.8  | 828.9  | 838.8  | 866.5  | 919.3  | 996.7  | 1021.4 | 1074.2 | 1084.4 | 970.4  |
| 25°   | 825.5  | 824.2  | 821.0  | 822.3  | 839.0  | 878.4  | 959.2  | 987.8  | 1057.9 | 1079.4 | 952.3  |
| 27.5° | 837.6  | 839.0  | 833.5  | 827.6  | 828.9  | 852.0  | 926.0  | 959.0  | 1044.6 | 1079.4 | 939.6  |
| 30°   | 862.1  | 862.7  | 858.6  | 851.1  | 840.9  | 844.5  | 902.9  | 936.0  | 1038.0 | 1086.8 | 931.5  |
| 32.5° | 889.0  | 892.5  | 892.0  | 885.9  | 871.4  | 856.4  | 897.4  | 927.5  | 1037.6 | 1103.3 | 930.6  |
| 35°   | 922.4  | 926.4  | 933.2  | 931.9  | 916.7  | 892.0  | 916.1  | 939.8  | 1047.1 | 1130.4 | 939.4  |
| 37.5° | 957.9  | 964.1  | 978.6  | 985.6  | 975.7  | 947.8  | 958.1  | 975.1  | 1072.6 | 1174.3 | 961.5  |
| 40°   | 992.4  | 999.3  | 1025.7 | 1053.0 | 1045.7 | 1016.9 | 1021.7 | 1035.3 | 1118.0 | 1237.5 | 1003.5 |
| 42.5° | 1026.1 | 1036.4 | 1075.4 | 1120.3 | 1129.1 | 1106.2 | 1108.7 | 1119.6 | 1185.3 | 1324.4 | 1072.1 |
| 45°   | 1066.4 | 1078.1 | 1135.7 | 1191.2 | 1214.8 | 1204.9 | 1215.9 | 1222.9 | 1273.3 | 1439.1 | 1164.6 |
| 47.5° | 1125.7 | 1139.1 | 1209.9 | 1273.0 | 1314.7 | 1321.1 | 1343.3 | 1347.9 | 1384.6 | 1572.9 | 1285.3 |
| 50°   | 1241.4 | 1245.1 | 1309.0 | 1366.3 | 1426.4 | 1465.1 | 1490.4 | 1493.9 | 1519.3 | 1719.0 | 1436.0 |
| 52.5° | 1386.9 | 1389.3 | 1425.5 | 1463.8 | 1532.2 | 1611.3 | 1670.3 | 1675.3 | 1680.6 | 1861.4 | 1584.7 |
| 55°   | 1531.4 | 1531.1 | 1554.9 | 1577.6 | 1655.7 | 1770.7 | 1898.6 | 1901.7 | 1863.4 | 1996.6 | 1698.4 |
| 57.5° | 1621.6 | 1630.4 | 1666.7 | 1695.8 | 1805.0 | 1952.3 | 2129.9 | 2141.2 | 2055.4 | 2096.7 | 1810.7 |
| 60°   | 1592.9 | 1597.1 | 1677.7 | 1785.2 | 1990.8 | 2210.6 | 2363.8 | 2366.8 | 2199.8 | 2196.7 | 1952.9 |
| 62.5° | 1357.2 | 1359.4 | 1486.0 | 1707.7 | 2085.0 | 2545.5 | 2646.2 | 2598.8 | 2365.8 | 2335.4 | 2122.9 |
| 65°   | 930.2  | 944.9  | 1050.6 | 1324.7 | 1912.0 | 2755.6 | 3083.1 | 3004.8 | 2618.9 | 2535.3 | 2276.6 |
| 67.5° | 547.7  | 544.7  | 597.0  | 798.9  | 1404.3 | 2616.1 | 3635.9 | 3558.0 | 2963.9 | 2669.3 | 2231.6 |
| 70°   | 374.2  | 372.1  | 392.1  | 483.7  | 792.7  | 2029.4 | 3809.8 | 3966.9 | 3268.6 | 2579.1 | 1920.6 |
| 72.5° | 267.1  | 268.2  | 297.8  | 375.8  | 497.7  | 1182.4 | 3276.3 | 3648.1 | 3173.2 | 2248.4 | 1459.8 |
| 75°   | 181.4  | 184.4  | 226.7  | 308.2  | 436.3  | 601.5  | 2325.0 | 2773.2 | 2583.9 | 1634.1 | 839.0  |
| 77.5° | 97.5   | 100.9  | 150.8  | 248.4  | 394.5  | 417.9  | 1495.5 | 1908.6 | 1623.1 | 734.6  | 243.2  |
| 80°   | 40.7   | 42.7   | 70.6   | 180.5  | 340.9  | 367.0  | 879.9  | 1157.4 | 691.7  | 144.9  | 54.2   |
| 82.5° | 17.6   | 18.5   | 29.4   | 107.7  | 254.9  | 309.9  | 465.9  | 556.8  | 209.6  | 31.9   | 27.3   |
| 85°   | 3.4    | 3.5    | 12.1   | 57.0   | 162.6  | 174.9  | 302.0  | 296.0  | 94.2   | 13.7   | 19.8   |
| 87.5° | 0.0    | 0.0    | 2.9    | 17.9   | 47.8   | 95.3   | 184.3  | 182.0  | 32.0   | 6.6    | 7.5    |
| 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-SL3-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1147.2 | 1147.2 | 1147.2 | 1147.2 | 1147.2 | 1147.2 | 1147.2 | 1147.2 | 1147.2 | 1147.2 | 1147.2 |
| 2.5°  | 1138.2 | 1127.0 | 1103.6 | 1074.7 | 1052.6 | 1028.1 | 1008.8 | 984.3  | 973.6  | 974.1  | 968.3  |
| 5°    | 1112.6 | 1089.7 | 1037.8 | 972.4  | 922.0  | 870.1  | 825.4  | 780.8  | 754.5  | 745.9  | 737.9  |
| 7.5°  | 1076.1 | 1039.8 | 957.2  | 856.4  | 771.1  | 687.8  | 615.3  | 551.5  | 511.1  | 491.4  | 484.1  |
| 10°   | 1034.9 | 983.9  | 864.3  | 731.5  | 609.8  | 497.1  | 403.1  | 321.4  | 288.8  | 266.6  | 260.9  |
| 12.5° | 998.8  | 929.7  | 773.6  | 603.5  | 459.0  | 323.0  | 233.4  | 182.5  | 160.3  | 151.7  | 150.2  |
| 15°   | 964.7  | 879.0  | 686.2  | 487.6  | 317.8  | 198.8  | 148.4  | 131.2  | 125.9  | 124.5  | 124.5  |
| 17.5° | 932.6  | 830.7  | 600.8  | 373.4  | 210.3  | 139.4  | 122.9  | 119.1  | 117.4  | 117.3  | 117.4  |
| 20°   | 899.0  | 782.4  | 516.7  | 273.6  | 146.8  | 118.0  | 113.6  | 111.4  | 110.9  | 110.9  | 110.9  |
| 22.5° | 866.9  | 734.2  | 435.0  | 195.4  | 117.7  | 107.7  | 105.5  | 104.0  | 103.5  | 103.3  | 103.0  |
| 25°   | 836.1  | 688.2  | 355.3  | 138.1  | 103.3  | 98.7   | 96.7   | 94.8   | 93.3   | 92.5   | 92.0   |
| 27.5° | 810.6  | 647.4  | 281.0  | 110.8  | 93.3   | 89.3   | 86.9   | 83.9   | 80.4   | 78.8   | 78.2   |
| 30°   | 790.5  | 610.1  | 216.6  | 93.5   | 83.9   | 79.9   | 76.2   | 71.2   | 66.0   | 63.3   | 63.2   |
| 32.5° | 774.7  | 573.5  | 164.4  | 82.7   | 75.5   | 70.6   | 65.2   | 59.0   | 53.0   | 49.9   | 49.7   |
| 35°   | 766.9  | 541.1  | 125.7  | 74.8   | 68.2   | 61.9   | 55.2   | 48.3   | 42.5   | 39.6   | 39.2   |
| 37.5° | 772.1  | 513.8  | 98.0   | 68.2   | 61.9   | 54.6   | 46.9   | 39.6   | 34.4   | 31.9   | 31.7   |
| 40°   | 791.0  | 496.4  | 79.6   | 62.5   | 56.5   | 47.6   | 39.2   | 32.4   | 28.1   | 26.0   | 25.8   |
| 42.5° | 831.2  | 490.0  | 68.0   | 57.8   | 51.3   | 41.2   | 32.6   | 26.8   | 22.7   | 21.3   | 21.0   |
| 45°   | 898.4  | 499.5  | 60.1   | 53.3   | 46.0   | 35.0   | 27.0   | 22.0   | 18.4   | 17.2   | 17.1   |
| 47.5° | 987.8  | 524.6  | 54.4   | 48.9   | 41.2   | 29.5   | 22.5   | 17.8   | 15.0   | 13.9   | 13.7   |
| 50°   | 1103.1 | 564.2  | 49.7   | 44.5   | 36.7   | 25.1   | 18.5   | 14.1   | 11.6   | 10.8   | 10.8   |
| 52.5° | 1228.6 | 611.6  | 45.6   | 40.5   | 32.1   | 20.9   | 15.0   | 10.8   | 9.2    | 8.2    | 8.2    |
| 55°   | 1332.3 | 652.9  | 41.0   | 37.4   | 26.6   | 17.2   | 11.5   | 8.2    | 6.8    | 6.3    | 6.3    |
| 57.5° | 1435.8 | 697.0  | 35.9   | 32.1   | 21.3   | 14.1   | 8.8    | 6.1    | 5.0    | 4.7    | 4.7    |
| 60°   | 1569.9 | 750.9  | 30.8   | 26.2   | 16.8   | 10.6   | 6.4    | 4.4    | 3.7    | 3.5    | 3.5    |
| 62.5° | 1717.6 | 782.6  | 26.4   | 21.0   | 13.0   | 7.9    | 4.7    | 2.9    | 2.7    | 2.7    | 2.6    |
| 65°   | 1807.9 | 737.9  | 22.1   | 16.8   | 10.2   | 6.0    | 3.1    | 2.1    | 2.4    | 2.2    | 2.0    |
| 67.5° | 1692.7 | 577.7  | 18.1   | 13.0   | 7.9    | 4.6    | 2.0    | 1.5    | 2.6    | 2.1    | 1.6    |
| 70°   | 1401.5 | 404.4  | 14.1   | 9.2    | 6.3    | 3.9    | 1.3    | 0.9    | 2.7    | 2.1    | 1.3    |
| 72.5° | 1048.8 | 270.6  | 11.2   | 6.1    | 4.7    | 3.4    | 1.1    | 0.5    | 2.4    | 1.8    | 1.1    |
| 75°   | 573.1  | 109.0  | 8.8    | 3.9    | 2.9    | 2.4    | 0.8    | 0.3    | 1.6    | 1.3    | 0.8    |
| 77.5° | 150.8  | 28.8   | 6.4    | 2.6    | 1.6    | 0.9    | 0.5    | 0.2    | 0.8    | 0.7    | 0.3    |
| 80°   | 38.5   | 11.2   | 4.2    | 1.8    | 1.1    | 0.5    | 0.0    | 0.0    | 0.2    | 0.0    | 0.0    |
| 82.5° | 20.5   | 4.7    | 2.6    | 1.3    | 0.7    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 85°   | 15.5   | 3.1    | 1.5    | 0.8    | 0.2    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 87.5° | 6.0    | 0.9    | 0.5    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

LM-79-08: 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



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| 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

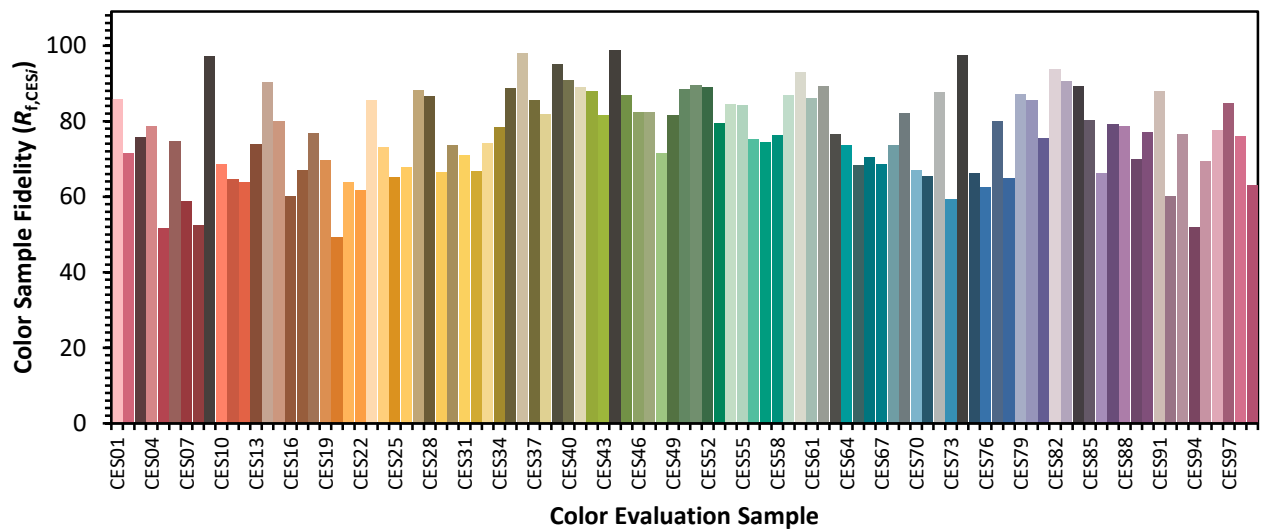


### Color Vector Graphics



**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)