

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: P386539

Luminaire Tested: **GWC-SA2B-722-U-T3**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P386539  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-14)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: MCGRAW-EDISON  
Catalog Number: GWC-SA2B-722-U-T3  
Description: GALLEON WALL LUMINAIRE  
(2) 70 CRI, 2200K, 800mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE III OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 8769 lumens  
Efficiency: N/A  
Efficacy: 103.2 lumens/watt  
Luminous Opening: Rectangular (W 1' x L: 0.5' x H: 0')  
IES Classification: Type III - Short  
BUG Rating: B2 - U0 - G2

Input Watts (W): 85  
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: 28.75 FT

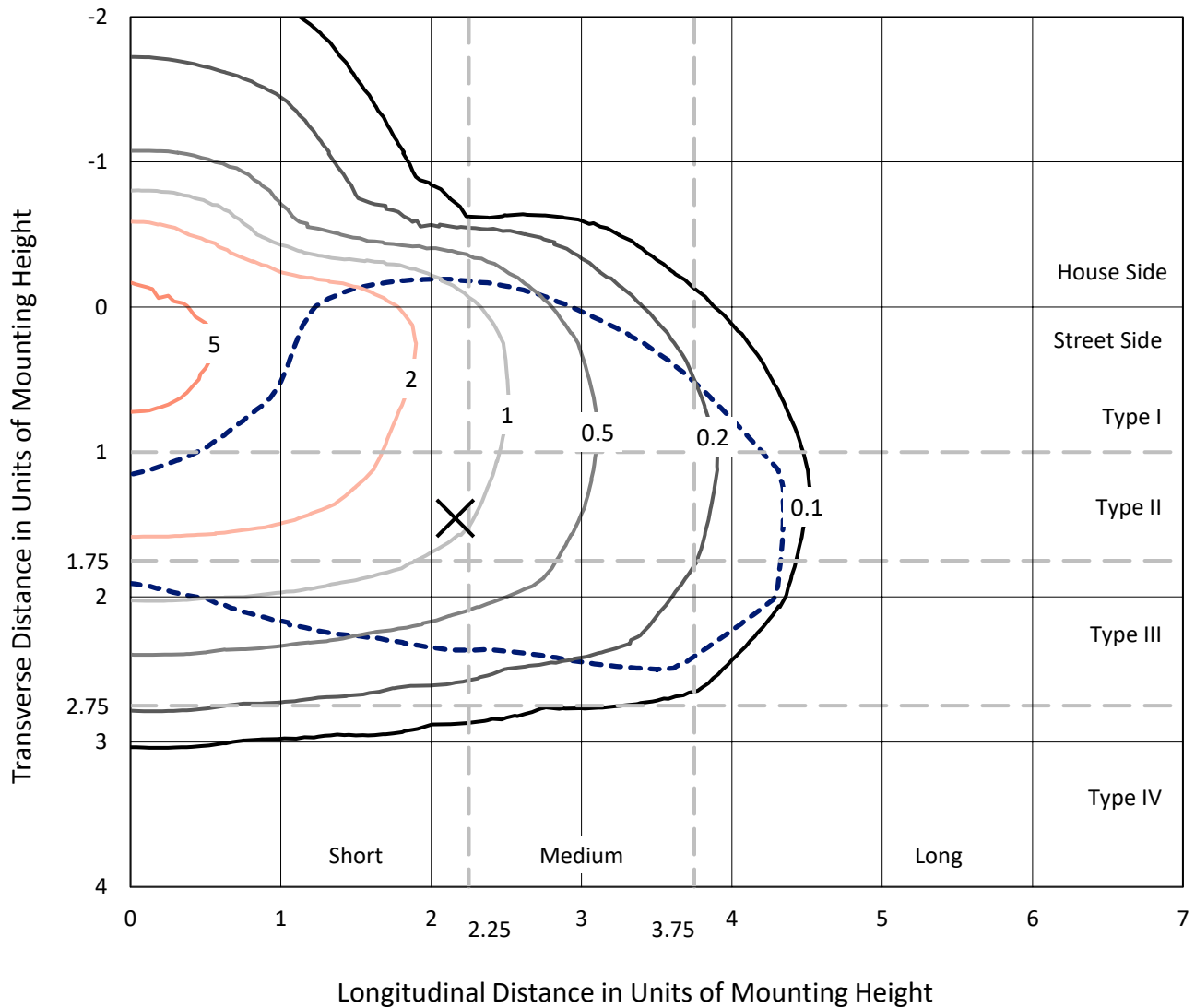


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## Iso-Footcandle Lines of Horizontal Illumination

✕ Max cd  
- - - 1/2 Max cd

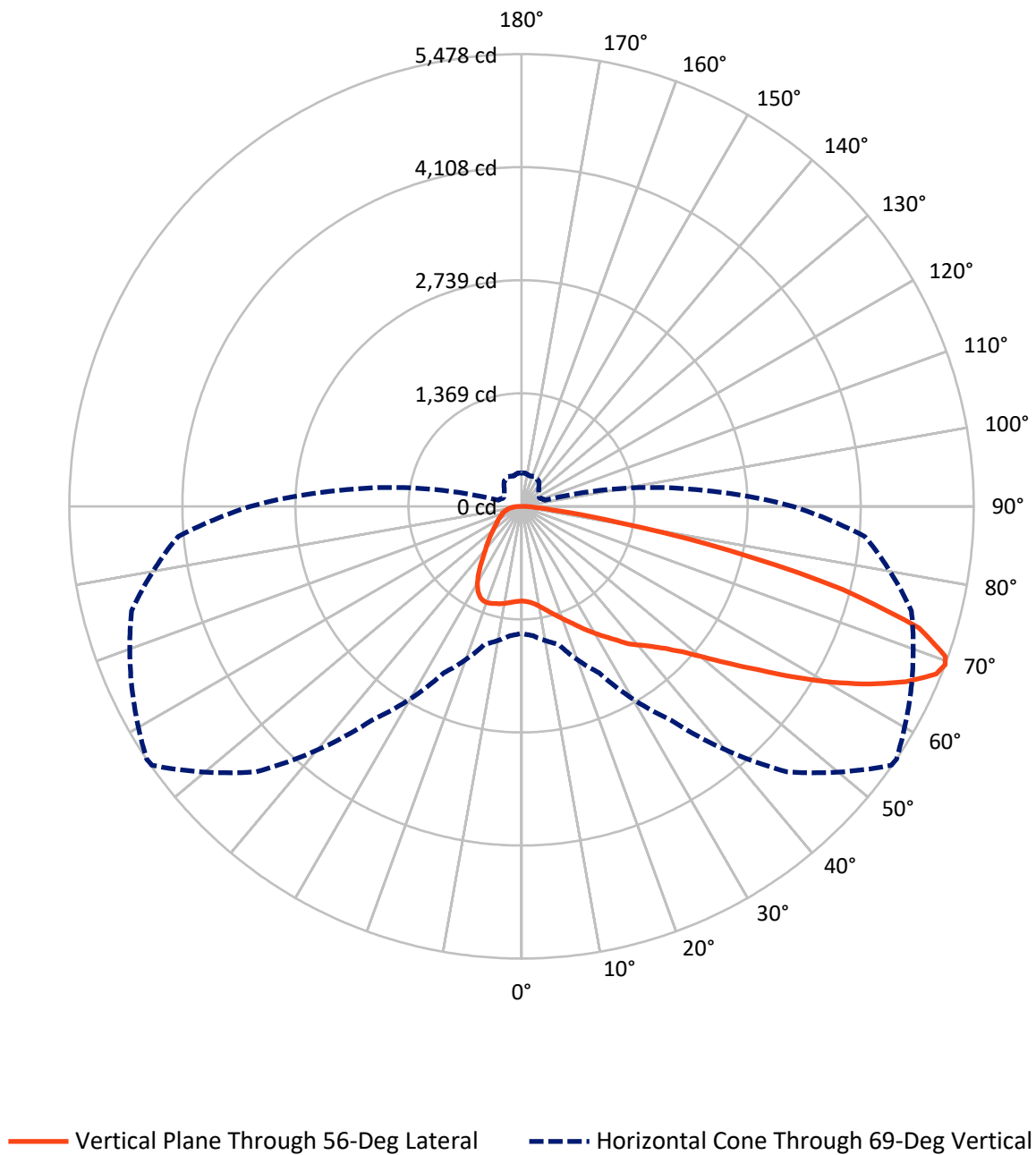


Based on 15 foot mounting height. Maximum calculated value = 5.5 fc  
Type III - Short - N/A

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## Luminous Intensity Polar Plot



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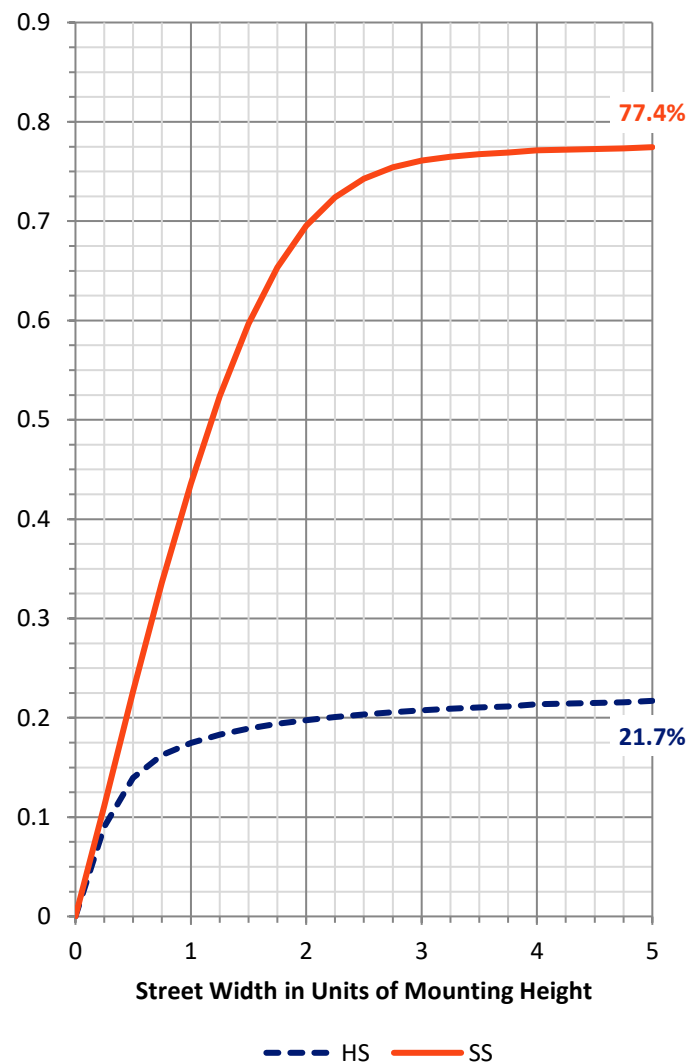
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 1952.8   | 0.0    | 1952.8 |
|                    | % Fixture | 22.3     | 0.0    | 22.3   |
| <b>Street Side</b> | Lumens    | 6816.2   | 0.0    | 6816.2 |
|                    | % Fixture | 77.7     | 0.0    | 77.7   |
| <b>Total</b>       | Lumens    | 8769.0   | 0.0    | 8769.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 112.6  | 1.3       |
| 10°-20°   | 362.1  | 4.1       |
| 20°-30°   | 632.0  | 7.2       |
| 30°-40°   | 907.9  | 10.4      |
| 40°-50°   | 1256.5 | 14.3      |
| 50°-60°   | 1840.9 | 21.0      |
| 60°-70°   | 2244.4 | 25.6      |
| 70°-80°   | 1240.8 | 14.2      |
| 80°-90°   | 171.9  | 2.0       |
| 90°-100°  | 0.0    | 0.0       |
| 100°-110° | 0.0    | 0.0       |
| 110°-120° | 0.0    | 0.0       |
| 120°-130° | 0.0    | 0.0       |
| 130°-140° | 0.0    | 0.0       |
| 140°-150° | 0.0    | 0.0       |
| 150°-160° | 0.0    | 0.0       |
| 160°-170° | 0.0    | 0.0       |
| 170°-180° | 0.0    | 0.0       |
| 0°-90°    | 8769.0 | 100.0     |
| 0°-180°   | 8769.0 | 100.0     |

**Coefficient of Utilization**



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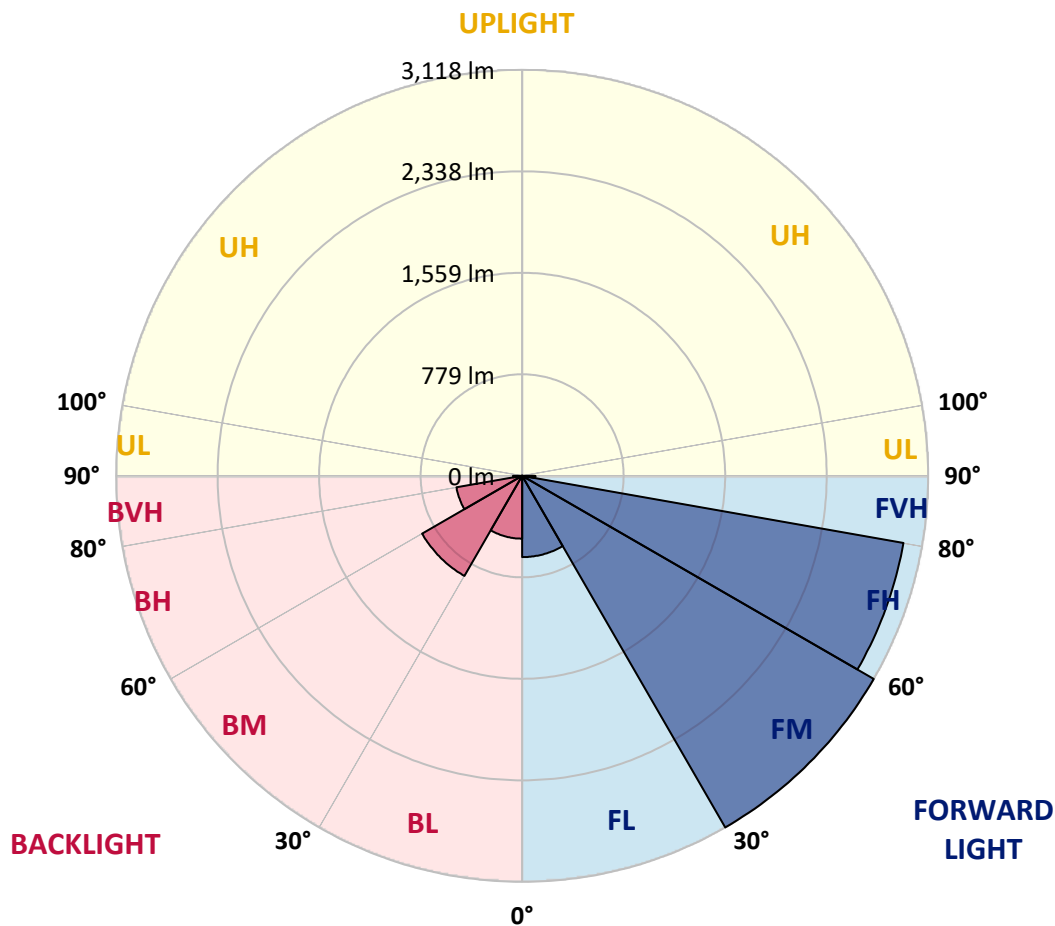
CATALOG NUMBER: GWC-SA2B-722-U-T3

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 624.1  | 7.1       |                         |      |         |
| FM   | (30°-60°)   | 3117.7 | 35.6      |                         |      |         |
| FH   | (60°-80°)   | 2973.1 | 33.9      |                         |      | G2/5000 |
| FVH  | (80°-90°)   | 101.2  | 1.2       |                         |      | G2/225  |
| BL   | (0°-30°)    | 482.6  | 5.5       | B1/500                  |      |         |
| BM   | (30°-60°)   | 887.5  | 10.1      | B1/1000                 |      |         |
| BH   | (60°-80°)   | 512.1  | 5.8       | B2/1000                 |      | G2/1000 |
| BVH  | (80°-90°)   | 70.6   | 0.8       |                         |      | G1/100  |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B2-U0-G2**

Type III Short



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 56°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1146.4 | 1146.4 | 1146.4 | 1146.4 | 1146.4 | 1146.4 | 1146.4 | 1146.4 | 1146.4 | 1146.4 | 1146.4 |
| 2.5°  | 1153.7 | 1154.9 | 1154.0 | 1156.4 | 1153.7 | 1155.5 | 1154.0 | 1154.0 | 1153.1 | 1150.3 | 1147.3 |
| 5°    | 1171.8 | 1174.2 | 1172.7 | 1175.1 | 1171.8 | 1172.4 | 1169.7 | 1169.7 | 1167.0 | 1161.2 | 1155.2 |
| 7.5°  | 1200.2 | 1202.9 | 1201.7 | 1204.1 | 1199.6 | 1199.6 | 1196.0 | 1195.7 | 1190.2 | 1180.9 | 1173.9 |
| 10°   | 1234.0 | 1237.6 | 1236.4 | 1240.1 | 1236.4 | 1237.6 | 1234.0 | 1234.0 | 1226.8 | 1213.5 | 1204.7 |
| 12.5° | 1283.3 | 1287.8 | 1284.5 | 1284.2 | 1282.7 | 1285.1 | 1282.1 | 1281.4 | 1274.8 | 1256.7 | 1244.6 |
| 15°   | 1349.1 | 1353.9 | 1347.0 | 1346.4 | 1337.9 | 1337.0 | 1337.0 | 1336.1 | 1331.9 | 1310.1 | 1290.2 |
| 17.5° | 1424.9 | 1426.4 | 1420.4 | 1410.7 | 1399.9 | 1392.9 | 1392.0 | 1394.4 | 1394.4 | 1369.1 | 1337.3 |
| 20°   | 1499.3 | 1502.0 | 1497.1 | 1486.3 | 1472.4 | 1462.1 | 1454.8 | 1459.7 | 1459.4 | 1429.2 | 1384.2 |
| 22.5° | 1580.2 | 1586.6 | 1579.3 | 1565.4 | 1549.1 | 1537.6 | 1524.9 | 1529.2 | 1529.5 | 1492.3 | 1430.1 |
| 25°   | 1685.0 | 1679.3 | 1674.8 | 1655.1 | 1631.9 | 1620.1 | 1608.3 | 1612.5 | 1611.3 | 1560.3 | 1477.5 |
| 27.5° | 1777.8 | 1779.0 | 1772.9 | 1752.1 | 1725.2 | 1699.2 | 1698.6 | 1701.3 | 1696.8 | 1631.0 | 1522.2 |
| 30°   | 1885.6 | 1886.2 | 1877.8 | 1859.0 | 1829.7 | 1796.2 | 1788.3 | 1792.9 | 1783.2 | 1698.0 | 1569.3 |
| 32.5° | 1992.9 | 1995.9 | 1986.5 | 1963.9 | 1940.3 | 1899.5 | 1883.8 | 1886.8 | 1862.7 | 1766.6 | 1618.0 |
| 35°   | 2086.8 | 2091.0 | 2088.0 | 2072.9 | 2047.2 | 2012.2 | 1993.5 | 1991.7 | 1961.7 | 1850.6 | 1682.3 |
| 37.5° | 2182.6 | 2186.5 | 2183.2 | 2170.5 | 2160.2 | 2123.1 | 2113.1 | 2113.1 | 2061.1 | 1936.4 | 1764.2 |
| 40°   | 2281.0 | 2287.1 | 2283.2 | 2265.6 | 2256.9 | 2240.0 | 2216.1 | 2210.4 | 2154.2 | 2039.4 | 1897.7 |
| 42.5° | 2372.6 | 2380.4 | 2396.1 | 2385.9 | 2368.0 | 2370.5 | 2322.4 | 2319.4 | 2278.3 | 2191.6 | 2065.4 |
| 45°   | 2502.5 | 2514.0 | 2540.5 | 2532.7 | 2529.1 | 2515.8 | 2458.7 | 2456.0 | 2440.2 | 2396.4 | 2273.5 |
| 47.5° | 2644.2 | 2659.9 | 2707.9 | 2709.4 | 2748.4 | 2723.3 | 2645.7 | 2636.3 | 2639.9 | 2641.7 | 2527.5 |
| 50°   | 2774.7 | 2791.9 | 2870.7 | 2907.9 | 2999.7 | 3005.1 | 2881.0 | 2872.5 | 2886.7 | 2928.4 | 2823.6 |
| 52.5° | 2878.9 | 2900.6 | 2999.1 | 3113.9 | 3271.3 | 3316.0 | 3170.7 | 3164.3 | 3174.9 | 3246.8 | 3158.3 |
| 55°   | 2955.3 | 2978.9 | 3086.1 | 3295.1 | 3546.5 | 3625.3 | 3504.2 | 3498.2 | 3504.8 | 3596.3 | 3522.3 |
| 57.5° | 2973.1 | 2978.9 | 3134.4 | 3417.2 | 3778.8 | 3968.2 | 3912.3 | 3900.2 | 3867.6 | 3947.4 | 3924.1 |
| 60°   | 2889.4 | 2912.4 | 3094.6 | 3460.1 | 3958.5 | 4306.2 | 4338.9 | 4323.8 | 4232.2 | 4297.5 | 4278.7 |
| 62.5° | 2719.7 | 2760.8 | 2945.6 | 3394.8 | 4028.9 | 4582.3 | 4757.2 | 4739.1 | 4581.4 | 4623.7 | 4533.7 |
| 65°   | 2442.4 | 2459.9 | 2654.1 | 3169.8 | 3939.5 | 4759.1 | 5130.3 | 5121.3 | 4922.8 | 4856.6 | 4580.8 |
| 67.5° | 1946.3 | 1979.3 | 2144.2 | 2699.4 | 3573.7 | 4738.2 | 5418.8 | 5417.9 | 5145.7 | 4943.0 | 4413.8 |
| 69°   | 1537.6 | 1571.8 | 1728.8 | 2223.7 | 3162.2 | 4547.6 | 5467.1 | 5477.7 | 5208.6 | 4890.5 | 4175.1 |
| 70°   | 1225.9 | 1265.4 | 1373.3 | 1872.9 | 2797.0 | 4296.3 | 5427.0 | 5446.0 | 5196.5 | 4803.8 | 3954.9 |
| 72.5° | 521.7  | 553.7  | 630.5  | 965.5  | 1704.7 | 3208.1 | 4962.1 | 5034.0 | 4916.4 | 4396.6 | 3268.6 |
| 75°   | 227.8  | 237.7  | 272.5  | 393.6  | 756.7  | 1746.1 | 3887.2 | 4020.2 | 4203.8 | 3716.3 | 2434.8 |
| 77.5° | 166.8  | 171.0  | 190.0  | 231.1  | 339.5  | 659.5  | 2499.8 | 2577.1 | 3031.7 | 2704.3 | 1493.5 |
| 80°   | 129.0  | 132.0  | 146.8  | 169.8  | 221.7  | 266.7  | 1140.1 | 1206.5 | 1704.7 | 1389.0 | 622.0  |
| 82.5° | 102.7  | 104.8  | 115.1  | 125.1  | 153.2  | 161.6  | 378.5  | 419.9  | 629.2  | 383.6  | 164.6  |
| 85°   | 95.5   | 97.9   | 101.5  | 91.2   | 98.2   | 94.9   | 163.7  | 171.3  | 190.0  | 150.7  | 68.9   |
| 87.5° | 43.2   | 51.1   | 100.6  | 71.0   | 52.3   | 41.7   | 67.1   | 70.1   | 78.8   | 79.1   | 30.5   |
| 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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**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1146.4 | 1146.4 | 1146.4 | 1146.4 | 1146.4 | 1146.4 | 1146.4 | 1146.4 | 1146.4 | 1146.4 | 1146.4 |
| 2.5°  | 1149.1 | 1148.2 | 1149.7 | 1146.1 | 1150.6 | 1150.3 | 1148.8 | 1149.4 | 1152.5 | 1152.2 | 1152.5 |
| 5°    | 1156.1 | 1155.5 | 1157.3 | 1154.6 | 1160.0 | 1161.8 | 1162.1 | 1164.8 | 1168.2 | 1169.1 | 1169.1 |
| 7.5°  | 1173.6 | 1173.6 | 1174.5 | 1170.9 | 1174.5 | 1174.2 | 1172.7 | 1175.4 | 1178.7 | 1179.0 | 1178.7 |
| 10°   | 1203.8 | 1204.1 | 1202.6 | 1193.2 | 1190.2 | 1182.1 | 1174.5 | 1174.8 | 1179.0 | 1182.4 | 1183.3 |
| 12.5° | 1241.9 | 1240.7 | 1234.0 | 1216.8 | 1204.1 | 1187.5 | 1179.6 | 1179.3 | 1183.6 | 1186.3 | 1187.2 |
| 15°   | 1285.4 | 1282.1 | 1264.8 | 1236.7 | 1214.4 | 1198.1 | 1185.4 | 1182.4 | 1179.9 | 1176.9 | 1177.2 |
| 17.5° | 1326.5 | 1318.9 | 1290.2 | 1251.2 | 1227.7 | 1205.9 | 1181.5 | 1161.8 | 1148.2 | 1140.4 | 1138.0 |
| 20°   | 1368.1 | 1353.3 | 1312.0 | 1264.8 | 1234.9 | 1195.4 | 1148.2 | 1108.4 | 1083.6 | 1072.1 | 1070.0 |
| 22.5° | 1406.2 | 1382.3 | 1332.2 | 1279.0 | 1229.2 | 1159.7 | 1085.7 | 1027.7 | 993.3  | 977.9  | 979.1  |
| 25°   | 1443.4 | 1410.1 | 1353.3 | 1289.0 | 1200.2 | 1096.9 | 998.7  | 927.4  | 887.5  | 870.3  | 869.7  |
| 27.5° | 1476.0 | 1438.2 | 1376.3 | 1280.8 | 1146.1 | 1007.5 | 895.7  | 826.2  | 793.0  | 778.2  | 775.8  |
| 30°   | 1513.4 | 1473.6 | 1406.8 | 1249.7 | 1067.0 | 904.1  | 795.1  | 746.2  | 722.6  | 707.8  | 705.1  |
| 32.5° | 1559.1 | 1521.6 | 1431.9 | 1193.2 | 965.8  | 796.3  | 716.5  | 682.4  | 661.0  | 644.3  | 641.3  |
| 35°   | 1625.5 | 1585.0 | 1438.2 | 1112.3 | 854.6  | 711.1  | 658.8  | 623.8  | 594.8  | 573.4  | 571.2  |
| 37.5° | 1708.9 | 1664.5 | 1423.7 | 1007.5 | 746.8  | 655.8  | 610.8  | 567.6  | 529.9  | 499.6  | 494.8  |
| 40°   | 1829.1 | 1762.1 | 1383.6 | 886.6  | 667.3  | 613.2  | 564.0  | 514.8  | 467.9  | 432.6  | 425.6  |
| 42.5° | 1973.5 | 1876.6 | 1321.9 | 766.4  | 609.0  | 570.0  | 517.5  | 456.5  | 411.7  | 386.7  | 383.0  |
| 45°   | 2157.2 | 1995.6 | 1236.4 | 661.3  | 551.6  | 526.8  | 467.3  | 411.1  | 383.3  | 364.9  | 361.9  |
| 47.5° | 2366.8 | 2129.1 | 1146.7 | 575.8  | 503.0  | 486.4  | 427.1  | 390.9  | 368.8  | 354.3  | 351.6  |
| 50°   | 2624.5 | 2279.8 | 1051.6 | 505.7  | 454.0  | 437.7  | 408.1  | 379.7  | 362.2  | 351.0  | 348.3  |
| 52.5° | 2915.1 | 2449.9 | 983.0  | 450.4  | 413.6  | 401.8  | 398.1  | 373.7  | 359.5  | 351.0  | 348.3  |
| 55°   | 3228.1 | 2623.0 | 909.0  | 403.9  | 378.5  | 381.8  | 391.5  | 374.3  | 364.6  | 354.3  | 350.4  |
| 57.5° | 3541.3 | 2801.8 | 826.5  | 364.6  | 350.7  | 367.0  | 387.0  | 375.5  | 367.3  | 357.4  | 353.7  |
| 60°   | 3789.1 | 2915.1 | 698.7  | 331.7  | 328.7  | 350.7  | 376.1  | 366.4  | 355.9  | 356.2  | 355.6  |
| 62.5° | 3904.8 | 2909.1 | 557.6  | 302.4  | 306.6  | 328.7  | 358.6  | 352.2  | 343.5  | 355.3  | 356.2  |
| 65°   | 3839.8 | 2764.1 | 434.1  | 275.8  | 283.1  | 305.7  | 340.5  | 345.3  | 348.3  | 371.0  | 374.0  |
| 67.5° | 3567.3 | 2481.9 | 336.2  | 252.5  | 261.6  | 290.0  | 342.3  | 376.1  | 380.0  | 403.9  | 403.6  |
| 69°   | 3285.5 | 2217.3 | 292.1  | 240.5  | 251.0  | 293.9  | 365.8  | 395.7  | 380.9  | 406.3  | 402.7  |
| 70°   | 3049.3 | 2008.0 | 268.6  | 232.3  | 246.2  | 300.9  | 381.5  | 395.4  | 376.4  | 398.1  | 392.1  |
| 72.5° | 2348.4 | 1444.6 | 227.8  | 217.2  | 229.9  | 287.9  | 386.1  | 386.7  | 365.8  | 370.1  | 359.8  |
| 75°   | 1610.7 | 912.9  | 198.8  | 196.7  | 205.1  | 259.5  | 371.6  | 369.5  | 338.3  | 332.3  | 323.8  |
| 77.5° | 888.1  | 463.7  | 168.9  | 177.0  | 182.8  | 229.9  | 337.7  | 334.7  | 309.0  | 296.3  | 293.3  |
| 80°   | 342.6  | 203.0  | 142.6  | 157.4  | 161.0  | 199.1  | 296.0  | 293.3  | 271.9  | 255.6  | 251.0  |
| 82.5° | 129.3  | 106.3  | 117.8  | 136.2  | 135.0  | 164.3  | 250.7  | 249.2  | 228.4  | 204.5  | 197.3  |
| 85°   | 59.8   | 63.7   | 93.3   | 112.4  | 103.6  | 121.7  | 200.6  | 203.3  | 177.9  | 149.5  | 149.5  |
| 87.5° | 25.4   | 35.6   | 66.2   | 84.9   | 69.8   | 82.2   | 147.1  | 140.5  | 129.0  | 89.4   | 84.0   |
| 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

(formerly Eaton)

STREETWORKS

Report Number: SP1-2101-121-4

Luminaire Tested: IFLD-S-SA2B-722-U-T3R

Test Date: 03/03/2021

### Test Information

Test Method: LM-79-08  
 Report Number: SP1-2101-121-4  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1  
 Measurement Geometry:  $4\pi$   
 Issue Date: 03/03/2021  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: STREETWORKS  
 Catalog Number: **IFLD-S-SA2B-722-U-T3R**  
 Description: STREETWORKS INF FLOOD

PROGRAMMED @ 800mA.

### Spectral Parameters

|                           |         |           |      |      |       |
|---------------------------|---------|-----------|------|------|-------|
| CCT (K):                  | 2218    | CRI (Ra): | 72.2 |      |       |
| CIE u':                   | 0.2889  | R1:       | 69.1 | R9:  | -16.8 |
| CIE v':                   | 0.5350  | R2:       | 83.2 | R10: | 61.9  |
| Duv:                      | -0.0005 | R3:       | 95.4 | R11: | 60.1  |
| CIE x:                    | 0.5026  | R4:       | 66.4 | R12: | 51.2  |
| CIE y:                    | 0.4136  | R5:       | 66.2 | R13: | 71.3  |
| CIE z:                    | 0.0839  | R6:       | 76.7 | R14: | 97.1  |
| Peak Wavelength (nm):     | 606     | R7:       | 76.7 |      |       |
| Dominant Wavelength (nm): | 587     | R8:       | 43.9 |      |       |
| Purity:                   | 75.3    |           |      |      |       |
| Rf:                       | 70      |           |      |      |       |
| Rg:                       | 99.3    |           |      |      |       |



### Test Conditions

Stabilization Time: 95M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 25.3/31%  
 Sphere Temperature (°C): 24.8

REPORT NUMBER: SP1-2101-121-4

| 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            |

REPORT NUMBER: SP1-2101-121-4

**CIE 1931 Chromaticity Diagram**



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



Point lies inside the ANSI 2200K 4-step quadrangle

REPORT NUMBER: SP1-2101-121-4

### 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       | 2623             | 0.0              | 490       | 7941             | 1.1              | 620       | 205150           | 53.4             | 750       | 13431            | 0.0              | 880       | 3867             | 0.0              |
| 365       | 2260             | 0.0              | 495       | 11299            | 2.0              | 625       | 198277           | 43.7             | 755       | 12426            | 0.0              | 885       | 3345             | 0.0              |
| 370       | 2306             | 0.0              | 500       | 16633            | 3.7              | 630       | 187878           | 34.0             | 760       | 11385            | 0.0              | 890       | 2956             | 0.0              |
| 375       | 2437             | 0.0              | 505       | 23672            | 6.6              | 635       | 176836           | 26.6             | 765       | 9797             | 0.0              | 895       | 2272             | 0.0              |
| 380       | 2473             | 0.0              | 510       | 32025            | 11.0             | 640       | 164455           | 19.7             | 770       | 8562             | 0.0              | 900       | 3003             | 0.0              |
| 385       | 2203             | 0.0              | 515       | 41295            | 17.1             | 645       | 154086           | 14.8             | 775       | 7810             | 0.0              | 905       | 2480             | 0.0              |
| 390       | 2262             | 0.0              | 520       | 50628            | 24.6             | 650       | 141592           | 10.3             | 780       | 7052             | 0.0              | 910       | 2068             | 0.0              |
| 395       | 2028             | 0.0              | 525       | 58836            | 31.6             | 655       | 128604           | 7.4              | 785       | 6345             | 0.0              | 915       | 2064             | 0.0              |
| 400       | 1806             | 0.0              | 530       | 67109            | 39.5             | 660       | 116713           | 4.9              | 790       | 5524             | 0.0              | 920       | 2581             | 0.0              |
| 405       | 1945             | 0.0              | 535       | 74404            | 46.1             | 665       | 104993           | 3.3              | 795       | 5788             | 0.0              | 925       | 3137             | 0.0              |
| 410       | 3199             | 0.0              | 540       | 81280            | 53.0             | 670       | 93149            | 2.0              | 800       | 5282             | 0.0              | 930       | 2747             | 0.0              |
| 415       | 5572             | 0.0              | 545       | 88806            | 59.1             | 675       | 82543            | 1.4              | 805       | 4258             | 0.0              | 935       | 2471             | 0.0              |
| 420       | 10322            | 0.0              | 550       | 97367            | 66.2             | 680       | 73089            | 0.8              | 810       | 5156             | 0.0              | 940       | 2339             | 0.0              |
| 425       | 18494            | 0.1              | 555       | 106598           | 72.8             | 685       | 64438            | 0.6              | 815       | 4391             | 0.0              | 945       | 2917             | 0.0              |
| 430       | 28541            | 0.2              | 560       | 117615           | 79.9             | 690       | 56546            | 0.3              | 820       | 4383             | 0.0              | 950       | 1966             | 0.0              |
| 435       | 37453            | 0.4              | 565       | 129103           | 85.8             | 695       | 49328            | 0.2              | 825       | 4881             | 0.0              | 955       | 1580             | 0.0              |
| 440       | 44455            | 0.7              | 570       | 141415           | 92.0             | 700       | 43493            | 0.1              | 830       | 3588             | 0.0              | 960       | 1318             | 0.0              |
| 445       | 45934            | 1.0              | 575       | 155854           | 97.0             | 705       | 38035            | 0.1              | 835       | 3835             | 0.0              | 965       | 1419             | 0.0              |
| 450       | 37926            | 1.0              | 580       | 168613           | 100.2            | 710       | 33716            | 0.0              | 840       | 3014             | 0.0              | 970       | 1917             | 0.0              |
| 455       | 24793            | 0.8              | 585       | 182390           | 101.3            | 715       | 30449            | 0.0              | 845       | 3765             | 0.0              | 975       | 1210             | 0.0              |
| 460       | 15340            | 0.6              | 590       | 194054           | 100.3            | 720       | 27240            | 0.0              | 850       | 2906             | 0.0              | 980       | 3915             | 0.0              |
| 465       | 10883            | 0.6              | 595       | 203639           | 96.5             | 725       | 24231            | 0.0              | 855       | 2947             | 0.0              | 985       | 3180             | 0.0              |
| 470       | 8138             | 0.5              | 600       | 211043           | 91.0             | 730       | 21490            | 0.0              | 860       | 3864             | 0.0              | 990       | 5676             | 0.0              |
| 475       | 6653             | 0.5              | 605       | 214591           | 83.1             | 735       | 18548            | 0.0              | 865       | 3546             | 0.0              | 995       | 4736             | 0.0              |
| 480       | 6220             | 0.6              | 610       | 214337           | 73.6             | 740       | 16963            | 0.0              | 870       | 3253             | 0.0              | 1000      | 5113             | 0.0              |
| 485       | 6613             | 0.8              | 615       | 211915           | 64.0             | 745       | 14922            | 0.0              | 875       | 2450             | 0.0              |           |                  |                  |

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### Scotopic Flux vs. Wavelength



Scotopic Lumens: 7290.1

S/P: 0.84

| 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       | 2623             | 0.0              | 490       | 7941             | 12.2             | 620       | 205150           | 2.6              | 750       | 13431            | 0.0              | 880       | 3867             | 0.0              |
| 365       | 2260             | 0.0              | 495       | 11299            | 18.3             | 625       | 198277           | 1.7              | 755       | 12426            | 0.0              | 885       | 3345             | 0.0              |
| 370       | 2306             | 0.0              | 500       | 16633            | 27.8             | 630       | 187878           | 1.1              | 760       | 11385            | 0.0              | 890       | 2956             | 0.0              |
| 375       | 2437             | 0.0              | 505       | 23672            | 40.2             | 635       | 176836           | 0.7              | 765       | 9797             | 0.0              | 895       | 2272             | 0.0              |
| 380       | 2473             | 0.0              | 510       | 32025            | 54.3             | 640       | 164455           | 0.4              | 770       | 8562             | 0.0              | 900       | 3003             | 0.0              |
| 385       | 2203             | 0.0              | 515       | 41295            | 68.4             | 645       | 154086           | 0.3              | 775       | 7810             | 0.0              | 905       | 2480             | 0.0              |
| 390       | 2262             | 0.0              | 520       | 50628            | 80.5             | 650       | 141592           | 0.2              | 780       | 7052             | 0.0              | 910       | 2068             | 0.0              |
| 395       | 2028             | 0.0              | 525       | 58836            | 88.0             | 655       | 128604           | 0.1              | 785       | 6345             | 0.0              | 915       | 2064             | 0.0              |
| 400       | 1806             | 0.0              | 530       | 67109            | 92.5             | 660       | 116713           | 0.1              | 790       | 5524             | 0.0              | 920       | 2581             | 0.0              |
| 405       | 1945             | 0.1              | 535       | 74404            | 92.7             | 665       | 104993           | 0.0              | 795       | 5788             | 0.0              | 925       | 3137             | 0.0              |
| 410       | 3199             | 0.2              | 540       | 81280            | 89.8             | 670       | 93149            | 0.0              | 800       | 5282             | 0.0              | 930       | 2747             | 0.0              |
| 415       | 5572             | 0.6              | 545       | 88806            | 85.1             | 675       | 82543            | 0.0              | 805       | 4258             | 0.0              | 935       | 2471             | 0.0              |
| 420       | 10322            | 1.7              | 550       | 97367            | 79.6             | 680       | 73089            | 0.0              | 810       | 5156             | 0.0              | 940       | 2339             | 0.0              |
| 425       | 18494            | 4.5              | 555       | 106598           | 72.8             | 685       | 64438            | 0.0              | 815       | 4391             | 0.0              | 945       | 2917             | 0.0              |
| 430       | 28541            | 9.7              | 560       | 117615           | 65.7             | 690       | 56546            | 0.0              | 820       | 4383             | 0.0              | 950       | 1966             | 0.0              |
| 435       | 37453            | 16.7             | 565       | 129103           | 57.9             | 695       | 49328            | 0.0              | 825       | 4881             | 0.0              | 955       | 1580             | 0.0              |
| 440       | 44455            | 24.8             | 570       | 141415           | 49.9             | 700       | 43493            | 0.0              | 830       | 3588             | 0.0              | 960       | 1318             | 0.0              |
| 445       | 45934            | 30.8             | 575       | 155854           | 42.4             | 705       | 38035            | 0.0              | 835       | 3835             | 0.0              | 965       | 1419             | 0.0              |
| 450       | 37926            | 29.4             | 580       | 168613           | 34.7             | 710       | 33716            | 0.0              | 840       | 3014             | 0.0              | 970       | 1917             | 0.0              |
| 455       | 24793            | 21.7             | 585       | 182390           | 27.9             | 715       | 30449            | 0.0              | 845       | 3765             | 0.0              | 975       | 1210             | 0.0              |
| 460       | 15340            | 14.8             | 590       | 194054           | 21.6             | 720       | 27240            | 0.0              | 850       | 2906             | 0.0              | 980       | 3915             | 0.0              |
| 465       | 10883            | 11.5             | 595       | 203639           | 16.2             | 725       | 24231            | 0.0              | 855       | 2947             | 0.0              | 985       | 3180             | 0.0              |
| 470       | 8138             | 9.4              | 600       | 211043           | 11.9             | 730       | 21490            | 0.0              | 860       | 3864             | 0.0              | 990       | 5676             | 0.0              |
| 475       | 6653             | 8.3              | 605       | 214591           | 8.4              | 735       | 18548            | 0.0              | 865       | 3546             | 0.0              | 995       | 4736             | 0.0              |
| 480       | 6220             | 8.4              | 610       | 214337           | 5.8              | 740       | 16963            | 0.0              | 870       | 3253             | 0.0              | 1000      | 5113             | 0.0              |
| 485       | 6613             | 9.6              | 615       | 211915           | 3.9              | 745       | 14922            | 0.0              | 875       | 2450             | 0.0              |           |                  |                  |

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### Melanopic Flux vs. Wavelength



**Melanopic Lumens: 2276.7**

**M/P: 0.26**

| 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       | 2623             | 0.0              | 490       | 7941             | 6.6              | 620       | 205150           | 0.2              | 750       | 13431            | 0.0              | 880       | 3867             | 0.0              |
| 365       | 2260             | 0.0              | 495       | 11299            | 9.3              | 625       | 198277           | 0.1              | 755       | 12426            | 0.0              | 885       | 3345             | 0.0              |
| 370       | 2306             | 0.0              | 500       | 16633            | 13.4             | 630       | 187878           | 0.1              | 760       | 11385            | 0.0              | 890       | 2956             | 0.0              |
| 375       | 2437             | 0.0              | 505       | 23672            | 18.2             | 635       | 176836           | 0.0              | 765       | 9797             | 0.0              | 895       | 2272             | 0.0              |
| 380       | 2473             | 0.0              | 510       | 32025            | 23.0             | 640       | 164455           | 0.0              | 770       | 8562             | 0.0              | 900       | 3003             | 0.0              |
| 385       | 2203             | 0.0              | 515       | 41295            | 27.0             | 645       | 154086           | 0.0              | 775       | 7810             | 0.0              | 905       | 2480             | 0.0              |
| 390       | 2262             | 0.0              | 520       | 50628            | 29.5             | 650       | 141592           | 0.0              | 780       | 7052             | 0.0              | 910       | 2068             | 0.0              |
| 395       | 2028             | 0.0              | 525       | 58836            | 29.8             | 655       | 128604           | 0.0              | 785       | 6345             | 0.0              | 915       | 2064             | 0.0              |
| 400       | 1806             | 0.0              | 530       | 67109            | 29.0             | 660       | 116713           | 0.0              | 790       | 5524             | 0.0              | 920       | 2581             | 0.0              |
| 405       | 1945             | 0.0              | 535       | 74404            | 26.8             | 665       | 104993           | 0.0              | 795       | 5788             | 0.0              | 925       | 3137             | 0.0              |
| 410       | 3199             | 0.1              | 540       | 81280            | 23.8             | 670       | 93149            | 0.0              | 800       | 5282             | 0.0              | 930       | 2747             | 0.0              |
| 415       | 5572             | 0.4              | 545       | 88806            | 20.6             | 675       | 82543            | 0.0              | 805       | 4258             | 0.0              | 935       | 2471             | 0.0              |
| 420       | 10322            | 1.2              | 550       | 97367            | 17.5             | 680       | 73089            | 0.0              | 810       | 5156             | 0.0              | 940       | 2339             | 0.0              |
| 425       | 18494            | 2.9              | 555       | 106598           | 14.4             | 685       | 64438            | 0.0              | 815       | 4391             | 0.0              | 945       | 2917             | 0.0              |
| 430       | 28541            | 6.0              | 560       | 117615           | 11.6             | 690       | 56546            | 0.0              | 820       | 4383             | 0.0              | 950       | 1966             | 0.0              |
| 435       | 37453            | 10.0             | 565       | 129103           | 9.1              | 695       | 49328            | 0.0              | 825       | 4881             | 0.0              | 955       | 1580             | 0.0              |
| 440       | 44455            | 14.9             | 570       | 141415           | 6.9              | 700       | 43493            | 0.0              | 830       | 3588             | 0.0              | 960       | 1318             | 0.0              |
| 445       | 45934            | 18.1             | 575       | 155854           | 5.2              | 705       | 38035            | 0.0              | 835       | 3835             | 0.0              | 965       | 1419             | 0.0              |
| 450       | 37926            | 17.5             | 580       | 168613           | 3.8              | 710       | 33716            | 0.0              | 840       | 3014             | 0.0              | 970       | 1917             | 0.0              |
| 455       | 24793            | 13.0             | 585       | 182390           | 2.7              | 715       | 30449            | 0.0              | 845       | 3765             | 0.0              | 975       | 1210             | 0.0              |
| 460       | 15340            | 9.0              | 590       | 194054           | 1.9              | 720       | 27240            | 0.0              | 850       | 2906             | 0.0              | 980       | 3915             | 0.0              |
| 465       | 10883            | 7.1              | 595       | 203639           | 1.3              | 725       | 24231            | 0.0              | 855       | 2947             | 0.0              | 985       | 3180             | 0.0              |
| 470       | 8138             | 5.8              | 600       | 211043           | 0.9              | 730       | 21490            | 0.0              | 860       | 3864             | 0.0              | 990       | 5676             | 0.0              |
| 475       | 6653             | 5.1              | 605       | 214591           | 0.6              | 735       | 18548            | 0.0              | 865       | 3546             | 0.0              | 995       | 4736             | 0.0              |
| 480       | 6220             | 5.0              | 610       | 214337           | 0.4              | 740       | 16963            | 0.0              | 870       | 3253             | 0.0              | 1000      | 5113             | 0.0              |
| 485       | 6613             | 5.5              | 615       | 211915           | 0.3              | 745       | 14922            | 0.0              | 875       | 2450             | 0.0              |           |                  |                  |

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TM-30-18

### Summary

$R_f = 70$   
 $R_g = 99.3$   
 CIE  $R_a = 72.2$   
 $R_g = -16.8$



### Color Vector Graphics

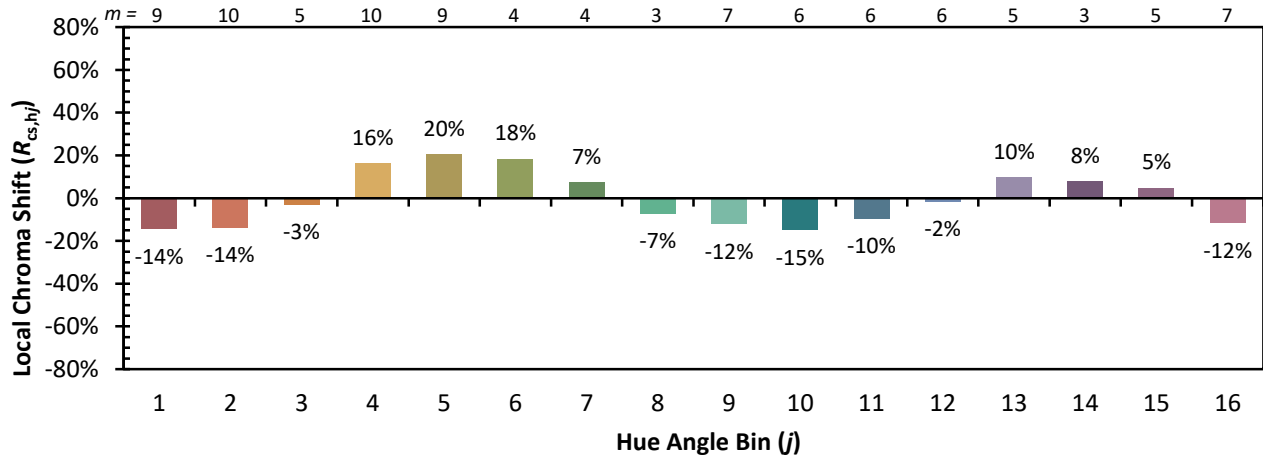


Individual Sample Fidelity Index ( $R_{f,i}$ )

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 87 | CES26 = 57 | CES51 = 74 | CES76 = 57 |
| CES02 = 65 | CES27 = 76 | CES52 = 76 | CES77 = 81 |
| CES03 = 32 | CES28 = 84 | CES53 = 65 | CES78 = 64 |
| CES04 = 72 | CES29 = 46 | CES54 = 78 | CES79 = 85 |
| CES05 = 52 | CES30 = 48 | CES55 = 75 | CES80 = 84 |
| CES06 = 52 | CES31 = 52 | CES56 = 65 | CES81 = 63 |
| CES07 = 44 | CES32 = 51 | CES57 = 62 | CES82 = 92 |
| CES08 = 43 | CES33 = 54 | CES58 = 66 | CES83 = 83 |
| CES09 = 29 | CES34 = 71 | CES59 = 84 | CES84 = 92 |
| CES10 = 79 | CES35 = 86 | CES60 = 90 | CES85 = 81 |
| CES11 = 62 | CES36 = 78 | CES61 = 84 | CES86 = 56 |
| CES12 = 68 | CES37 = 80 | CES62 = 71 | CES87 = 78 |
| CES13 = 45 | CES38 = 54 | CES63 = 68 | CES88 = 72 |
| CES14 = 75 | CES39 = 90 | CES64 = 69 | CES89 = 62 |
| CES15 = 72 | CES40 = 85 | CES65 = 67 | CES90 = 67 |
| CES16 = 49 | CES41 = 75 | CES66 = 64 | CES91 = 90 |
| CES17 = 51 | CES42 = 79 | CES67 = 63 | CES92 = 67 |
| CES18 = 57 | CES43 = 64 | CES68 = 70 | CES93 = 78 |
| CES19 = 74 | CES44 = 98 | CES69 = 80 | CES94 = 52 |
| CES20 = 68 | CES45 = 73 | CES70 = 64 | CES95 = 76 |
| CES21 = 89 | CES46 = 67 | CES71 = 64 | CES96 = 78 |
| CES22 = 81 | CES47 = 61 | CES72 = 87 | CES97 = 77 |
| CES23 = 92 | CES48 = 48 | CES73 = 57 | CES98 = 72 |
| CES24 = 92 | CES49 = 64 | CES74 = 87 | CES99 = 65 |
| CES25 = 74 | CES50 = 74 | CES75 = 66 |            |



Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)