

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: P319076

Luminaire Tested: **GLEON-SA2B-750-U-T4W**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P319076  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-18)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA2B-750-U-T4W  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(2) 70 CRI, 5000K, 800mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE IV WIDE OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 11610 lumens  
Efficiency: N/A  
Efficacy: 136.6 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 1' x H: 0')  
IES Classification: Type IV - 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: 24 FT

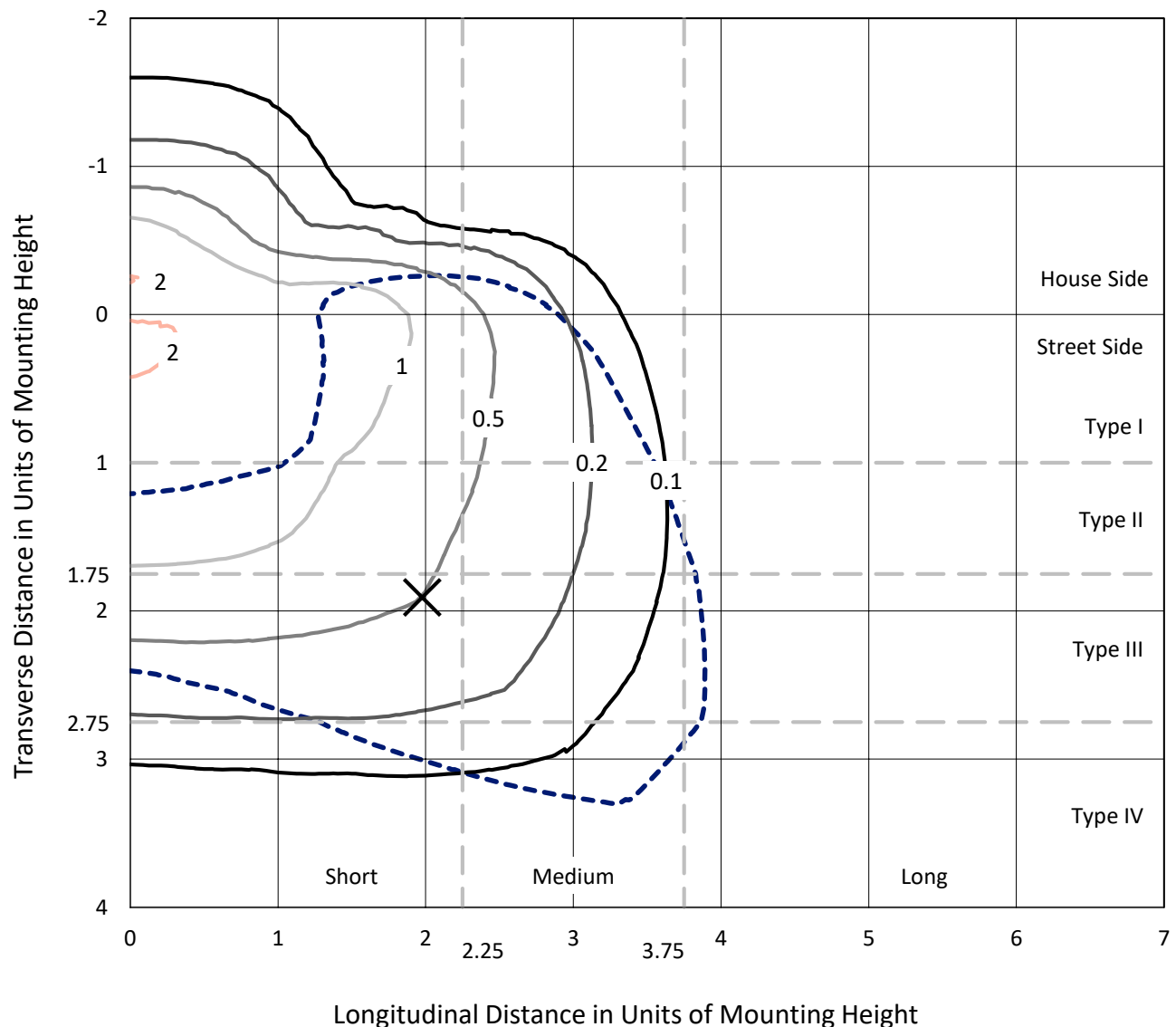


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## Iso-Footcandle Lines of Horizontal Illumination

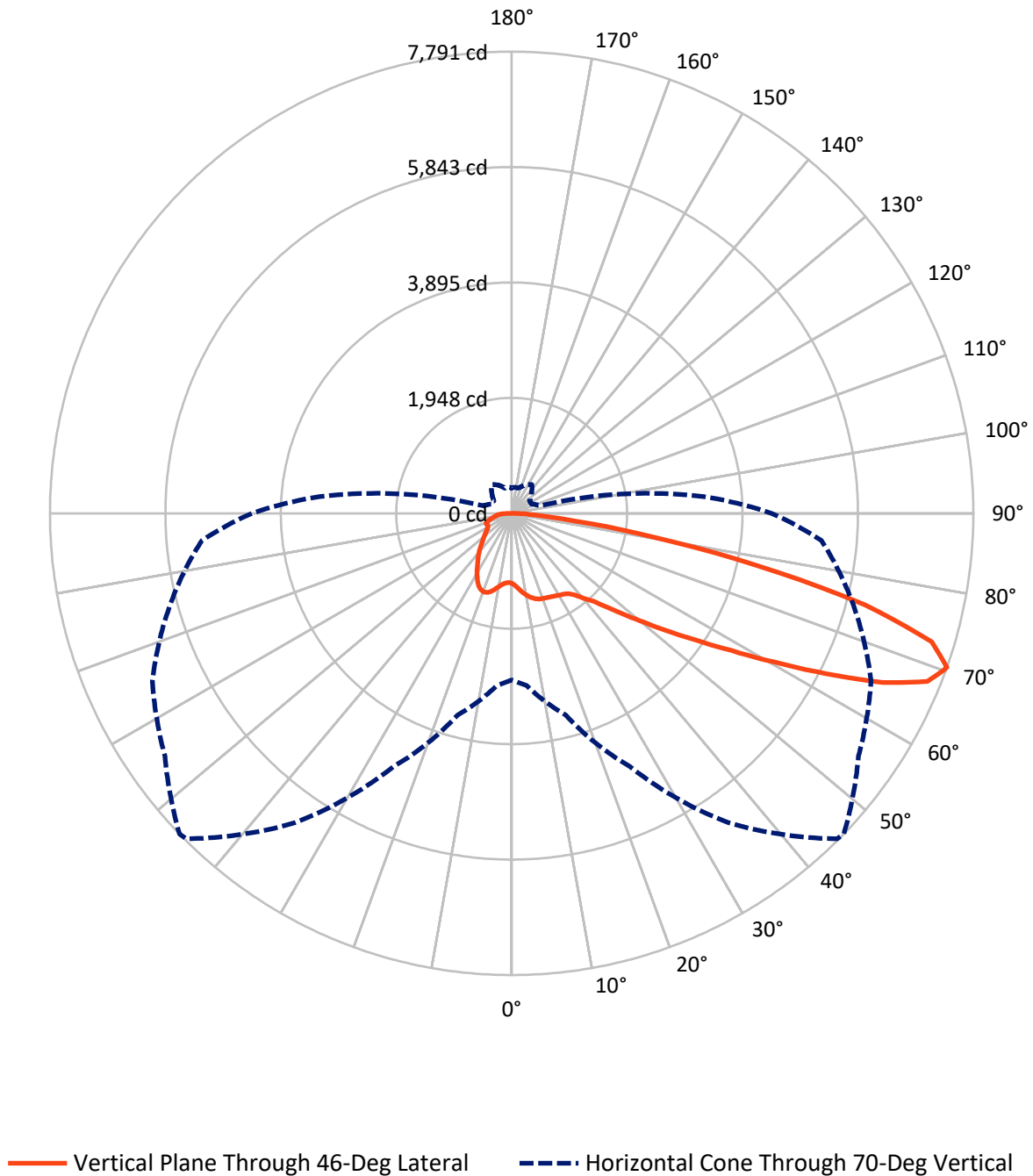
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 2.4 fc  
 Type IV - Short - N/A

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CATALOG NUMBER: GLEON-SA2B-750-U-T4W

## Luminous Intensity Polar Plot



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CATALOG NUMBER: GLEON-SA2B-750-U-T4W

**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 2661.0   | 0.0    | 2661.0  |
|                    | % Fixture | 22.9     | 0.0    | 22.9    |
| <b>Street Side</b> | Lumens    | 8949.0   | 0.0    | 8949.0  |
|                    | % Fixture | 77.1     | 0.0    | 77.1    |
| <b>Total</b>       | Lumens    | 11610.0  | 0.0    | 11610.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 120.6   | 1.0       |
| 10°-20°   | 401.7   | 3.5       |
| 20°-30°   | 669.9   | 5.8       |
| 30°-40°   | 950.6   | 8.2       |
| 40°-50°   | 1398.2  | 12.0      |
| 50°-60°   | 2367.9  | 20.4      |
| 60°-70°   | 3361.2  | 29.0      |
| 70°-80°   | 2042.0  | 17.6      |
| 80°-90°   | 298.0   | 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°    | 11610.0 | 100.0     |
| 0°-180°   | 11610.0 | 100.0     |

**Coefficient of Utilization**



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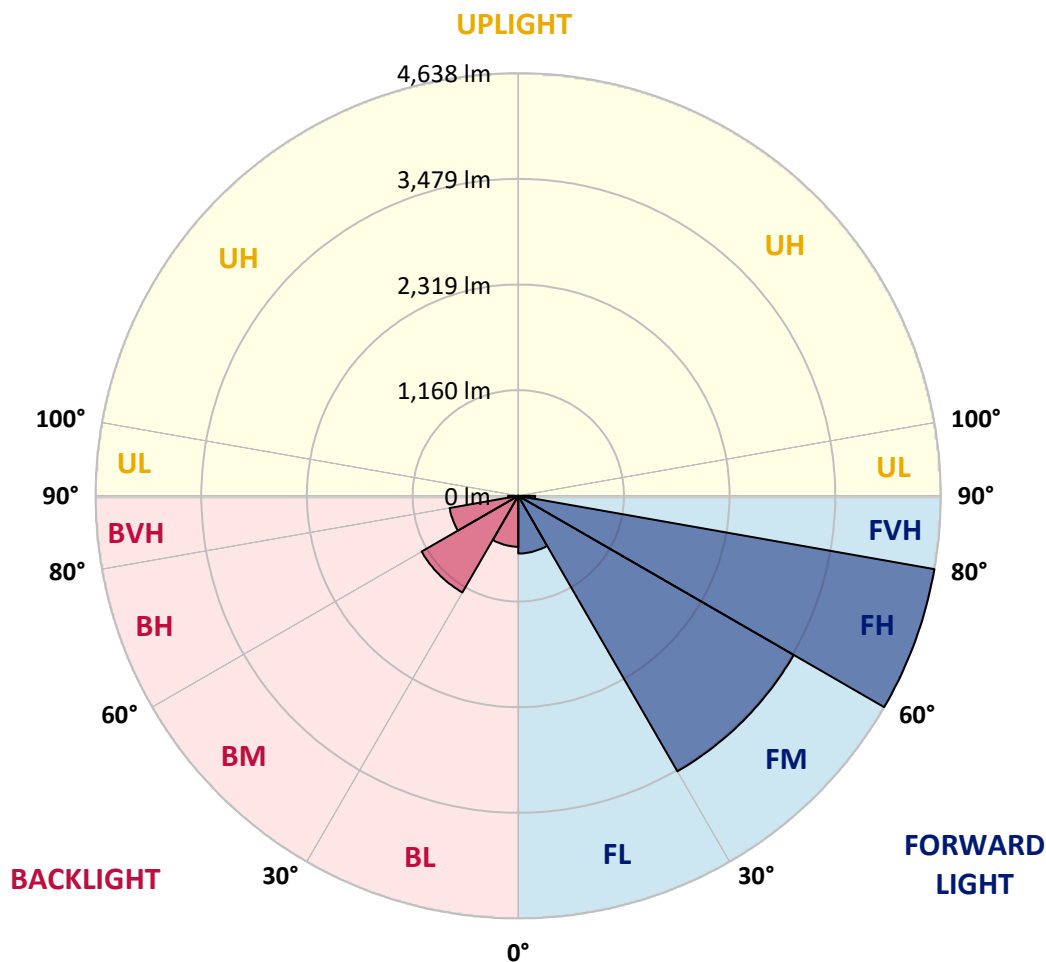
CATALOG NUMBER: GLEON-SA2B-750-U-T4W

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 633.5  | 5.5       |                         |      |         |
| FM   | (30°-60°)   | 3491.8 | 30.1      |                         |      |         |
| FH   | (60°-80°)   | 4638.1 | 39.9      |                         |      | G2/5000 |
| FVH  | (80°-90°)   | 185.6  | 1.6       |                         |      | G2/225  |
| BL   | (0°-30°)    | 558.7  | 4.8       | B2/1000                 |      |         |
| BM   | (30°-60°)   | 1224.9 | 10.6      | B2/2500                 |      |         |
| BH   | (60°-80°)   | 765.0  | 6.6       | B2/1000                 |      | G2/1000 |
| BVH  | (80°-90°)   | 112.4  | 1.0       |                         |      | G2/225  |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

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

Type IV Short





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CATALOG NUMBER: GLEON-SA2B-750-U-T4W

**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 46°    | 55°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1182.8 | 1182.8 | 1182.8 | 1182.8 | 1182.8 | 1182.8 | 1182.8 | 1182.8 | 1182.8 | 1182.8 | 1182.8 |
| 2.5°  | 1242.0 | 1242.8 | 1244.4 | 1240.4 | 1229.3 | 1226.1 | 1224.9 | 1213.4 | 1205.9 | 1194.8 | 1185.2 |
| 5°    | 1341.4 | 1342.2 | 1339.8 | 1328.6 | 1304.0 | 1285.7 | 1284.1 | 1257.9 | 1234.1 | 1208.7 | 1189.6 |
| 7.5°  | 1445.1 | 1446.3 | 1438.7 | 1417.6 | 1383.1 | 1351.3 | 1349.3 | 1313.6 | 1277.4 | 1238.9 | 1210.2 |
| 10°   | 1536.8 | 1532.1 | 1519.8 | 1490.4 | 1449.4 | 1410.5 | 1408.9 | 1371.6 | 1329.8 | 1283.4 | 1245.2 |
| 12.5° | 1598.0 | 1594.1 | 1578.2 | 1542.4 | 1497.5 | 1461.8 | 1458.6 | 1424.0 | 1383.5 | 1332.6 | 1286.9 |
| 15°   | 1631.8 | 1634.6 | 1613.1 | 1572.6 | 1528.9 | 1498.7 | 1495.9 | 1471.3 | 1435.1 | 1383.9 | 1331.4 |
| 17.5° | 1636.2 | 1638.6 | 1617.9 | 1577.8 | 1542.0 | 1521.4 | 1520.2 | 1503.9 | 1477.6 | 1428.4 | 1373.5 |
| 20°   | 1610.7 | 1612.3 | 1595.3 | 1562.3 | 1538.8 | 1532.5 | 1532.1 | 1524.9 | 1505.5 | 1461.8 | 1408.5 |
| 22.5° | 1573.8 | 1575.0 | 1562.7 | 1538.8 | 1530.9 | 1540.8 | 1543.6 | 1540.8 | 1526.9 | 1486.0 | 1435.9 |
| 25°   | 1564.7 | 1563.9 | 1551.2 | 1526.9 | 1533.7 | 1554.7 | 1558.3 | 1559.5 | 1550.0 | 1514.2 | 1470.9 |
| 27.5° | 1608.8 | 1606.0 | 1581.7 | 1542.8 | 1547.2 | 1572.6 | 1577.4 | 1588.9 | 1582.9 | 1551.5 | 1510.6 |
| 30°   | 1736.3 | 1731.5 | 1681.9 | 1603.2 | 1581.7 | 1594.9 | 1600.8 | 1619.1 | 1620.3 | 1594.1 | 1563.5 |
| 32.5° | 1951.7 | 1945.7 | 1856.7 | 1716.0 | 1640.2 | 1617.5 | 1623.1 | 1650.5 | 1665.2 | 1644.9 | 1611.9 |
| 35°   | 2223.8 | 2217.1 | 2100.3 | 1907.9 | 1737.9 | 1660.8 | 1664.8 | 1686.6 | 1716.0 | 1687.4 | 1643.7 |
| 37.5° | 2507.5 | 2491.2 | 2378.8 | 2133.6 | 1893.2 | 1753.4 | 1753.4 | 1756.2 | 1770.1 | 1710.5 | 1681.1 |
| 40°   | 2789.6 | 2773.3 | 2671.6 | 2399.0 | 2094.3 | 1899.2 | 1890.1 | 1828.5 | 1817.4 | 1766.1 | 1756.2 |
| 42.5° | 3051.8 | 3047.1 | 2987.1 | 2699.0 | 2330.3 | 2042.6 | 2029.9 | 1925.4 | 1927.8 | 1896.0 | 1896.4 |
| 45°   | 3330.8 | 3330.8 | 3281.9 | 3001.8 | 2605.2 | 2273.1 | 2260.4 | 2106.6 | 2130.4 | 2115.7 | 2151.1 |
| 47.5° | 3558.4 | 3565.6 | 3558.8 | 3317.3 | 2925.1 | 2565.9 | 2542.9 | 2357.7 | 2424.5 | 2474.9 | 2577.8 |
| 50°   | 3790.9 | 3802.0 | 3803.2 | 3663.3 | 3311.7 | 2914.0 | 2887.7 | 2691.1 | 2840.1 | 2984.7 | 3186.9 |
| 52.5° | 4128.2 | 4153.2 | 4053.5 | 4008.6 | 3785.3 | 3327.2 | 3301.4 | 3119.8 | 3368.5 | 3571.5 | 3920.0 |
| 55°   | 4440.9 | 4419.0 | 4347.9 | 4375.7 | 4292.3 | 3797.6 | 3778.1 | 3618.8 | 3957.3 | 4221.2 | 4673.7 |
| 57.5° | 4610.1 | 4608.6 | 4680.1 | 4799.3 | 4839.0 | 4377.7 | 4361.4 | 4206.5 | 4621.3 | 4819.5 | 5381.3 |
| 60°   | 4808.8 | 4811.6 | 4988.8 | 5259.4 | 5423.1 | 5100.0 | 5092.9 | 4975.3 | 5266.1 | 5378.2 | 5936.4 |
| 62.5° | 4836.6 | 4886.7 | 5191.8 | 5657.5 | 5969.8 | 5944.0 | 5959.9 | 5667.8 | 5843.0 | 5824.0 | 6350.8 |
| 65°   | 4516.8 | 4582.7 | 5135.0 | 5777.9 | 6513.3 | 6866.9 | 6881.6 | 6364.3 | 6298.0 | 6205.0 | 6499.0 |
| 67.5° | 3861.2 | 3958.9 | 4558.9 | 5516.0 | 6692.5 | 7549.1 | 7569.8 | 6904.3 | 6675.4 | 6334.1 | 6142.2 |
| 70°   | 2809.9 | 2918.3 | 3522.3 | 4711.1 | 6373.1 | 7767.3 | 7790.7 | 7143.1 | 6689.7 | 5966.6 | 5243.5 |
| 72.5° | 1697.4 | 1782.4 | 2280.2 | 3468.2 | 5379.0 | 7370.0 | 7411.7 | 6840.3 | 6107.7 | 5054.0 | 3871.9 |
| 75°   | 745.4  | 801.0  | 1102.6 | 1998.5 | 3850.9 | 6097.7 | 6149.8 | 5855.0 | 4962.6 | 3672.9 | 2288.6 |
| 77.5° | 317.5  | 333.4  | 452.2  | 868.2  | 2176.9 | 4166.7 | 4238.2 | 4278.0 | 3366.9 | 1998.5 | 967.1  |
| 80°   | 197.9  | 204.2  | 255.9  | 393.0  | 1018.7 | 2340.2 | 2417.3 | 2517.0 | 1671.9 | 734.7  | 337.7  |
| 82.5° | 120.4  | 127.5  | 170.1  | 237.6  | 530.4  | 1060.9 | 1097.8 | 1168.1 | 648.8  | 317.5  | 174.8  |
| 85°   | 72.3   | 77.5   | 104.1  | 150.2  | 302.0  | 417.2  | 416.8  | 460.9  | 305.5  | 204.2  | 92.2   |
| 87.5° | 34.6   | 38.5   | 55.6   | 77.9   | 152.2  | 156.5  | 146.6  | 166.1  | 185.6  | 133.9  | 46.5   |
| 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°    | 1182.8 | 1182.8 | 1182.8 | 1182.8 | 1182.8 | 1182.8 | 1182.8 | 1182.8 | 1182.8 | 1182.8 | 1182.8 |
| 2.5°  | 1182.0 | 1180.4 | 1175.3 | 1171.3 | 1170.5 | 1168.1 | 1166.1 | 1167.3 | 1168.9 | 1169.3 | 1169.3 |
| 5°    | 1181.6 | 1177.3 | 1170.5 | 1167.7 | 1171.3 | 1176.1 | 1182.0 | 1190.0 | 1194.8 | 1198.3 | 1200.7 |
| 7.5°  | 1200.7 | 1192.4 | 1184.8 | 1183.2 | 1190.4 | 1203.1 | 1216.6 | 1233.3 | 1244.8 | 1252.8 | 1254.3 |
| 10°   | 1232.5 | 1222.2 | 1214.6 | 1216.2 | 1228.9 | 1247.2 | 1266.3 | 1287.7 | 1305.2 | 1315.9 | 1316.7 |
| 12.5° | 1269.1 | 1259.1 | 1252.0 | 1258.7 | 1279.8 | 1302.0 | 1321.9 | 1340.6 | 1356.5 | 1367.2 | 1367.2 |
| 15°   | 1311.2 | 1304.0 | 1295.7 | 1311.2 | 1339.8 | 1359.6 | 1368.0 | 1377.1 | 1385.9 | 1393.8 | 1392.2 |
| 17.5° | 1351.7 | 1344.9 | 1340.6 | 1358.8 | 1388.6 | 1397.8 | 1392.2 | 1385.5 | 1385.5 | 1389.8 | 1390.6 |
| 20°   | 1386.7 | 1380.7 | 1383.5 | 1401.4 | 1416.9 | 1407.3 | 1386.7 | 1365.2 | 1356.5 | 1358.8 | 1361.2 |
| 22.5° | 1417.3 | 1414.5 | 1422.8 | 1431.2 | 1420.0 | 1386.7 | 1348.5 | 1319.5 | 1308.8 | 1308.0 | 1308.8 |
| 25°   | 1453.0 | 1452.6 | 1462.9 | 1447.8 | 1398.6 | 1337.0 | 1285.7 | 1257.5 | 1251.6 | 1256.3 | 1264.3 |
| 27.5° | 1497.5 | 1501.9 | 1507.0 | 1451.8 | 1354.9 | 1261.9 | 1209.8 | 1190.4 | 1196.3 | 1207.9 | 1215.4 |
| 30°   | 1554.3 | 1566.2 | 1555.1 | 1441.9 | 1292.1 | 1176.1 | 1126.4 | 1120.8 | 1137.1 | 1153.4 | 1161.4 |
| 32.5° | 1609.6 | 1628.2 | 1601.2 | 1416.1 | 1211.0 | 1085.1 | 1046.5 | 1045.0 | 1064.8 | 1080.7 | 1091.8 |
| 35°   | 1654.1 | 1691.0 | 1635.8 | 1364.8 | 1117.3 | 1001.3 | 973.0  | 962.3  | 969.5  | 988.1  | 1000.9 |
| 37.5° | 1712.1 | 1773.7 | 1659.6 | 1286.5 | 1015.6 | 932.1  | 899.1  | 874.5  | 868.2  | 875.7  | 882.1  |
| 40°   | 1818.2 | 1899.6 | 1670.7 | 1177.3 | 916.2  | 863.0  | 829.6  | 793.5  | 768.4  | 750.1  | 750.5  |
| 42.5° | 1991.4 | 2063.7 | 1663.6 | 1044.6 | 824.4  | 795.4  | 757.7  | 716.0  | 675.4  | 634.1  | 630.9  |
| 45°   | 2272.7 | 2307.7 | 1642.1 | 903.9  | 743.8  | 724.7  | 689.4  | 647.6  | 593.6  | 546.7  | 542.3  |
| 47.5° | 2722.9 | 2645.4 | 1608.8 | 781.1  | 672.7  | 664.7  | 632.1  | 584.1  | 526.9  | 489.1  | 485.9  |
| 50°   | 3336.7 | 3132.9 | 1592.5 | 683.4  | 609.9  | 612.3  | 585.7  | 534.8  | 480.8  | 452.9  | 449.8  |
| 52.5° | 4071.0 | 3700.7 | 1623.9 | 607.9  | 559.4  | 567.8  | 547.9  | 500.2  | 454.9  | 433.1  | 429.9  |
| 55°   | 4832.6 | 4288.7 | 1657.6 | 553.1  | 511.8  | 528.0  | 521.3  | 482.0  | 441.0  | 420.8  | 418.0  |
| 57.5° | 5484.7 | 4727.8 | 1590.1 | 508.6  | 469.2  | 494.7  | 500.6  | 470.4  | 433.9  | 415.6  | 412.4  |
| 60°   | 5895.1 | 4904.6 | 1412.9 | 466.9  | 435.5  | 468.0  | 488.7  | 467.3  | 436.7  | 435.1  | 432.7  |
| 62.5° | 6089.8 | 4889.1 | 1147.1 | 433.9  | 414.4  | 456.5  | 497.4  | 485.1  | 468.4  | 482.7  | 483.9  |
| 65°   | 6002.4 | 4655.4 | 854.2  | 412.0  | 399.3  | 460.9  | 523.7  | 518.9  | 477.6  | 491.9  | 493.9  |
| 67.5° | 5427.0 | 4098.0 | 632.5  | 393.0  | 382.6  | 473.2  | 571.4  | 530.0  | 459.7  | 470.0  | 463.7  |
| 70°   | 4386.5 | 3248.9 | 487.9  | 371.5  | 365.5  | 471.6  | 592.8  | 523.3  | 440.2  | 442.6  | 425.5  |
| 72.5° | 3024.8 | 2215.5 | 396.9  | 351.6  | 340.9  | 429.9  | 577.7  | 506.6  | 423.9  | 405.7  | 383.0  |
| 75°   | 1644.9 | 1189.2 | 337.3  | 331.0  | 297.6  | 377.5  | 549.9  | 494.7  | 409.2  | 385.0  | 372.3  |
| 77.5° | 647.2  | 493.5  | 292.8  | 302.8  | 260.2  | 333.4  | 518.9  | 472.0  | 389.0  | 357.2  | 350.8  |
| 80°   | 264.2  | 251.9  | 242.8  | 261.8  | 223.7  | 291.6  | 481.6  | 445.4  | 364.7  | 331.4  | 318.7  |
| 82.5° | 149.8  | 156.5  | 188.7  | 206.6  | 181.6  | 268.6  | 463.7  | 423.9  | 335.7  | 296.8  | 281.7  |
| 85°   | 76.7   | 91.8   | 131.5  | 148.2  | 133.5  | 228.5  | 427.1  | 371.1  | 269.4  | 227.3  | 228.5  |
| 87.5° | 37.0   | 51.3   | 83.0   | 93.0   | 86.6   | 165.3  | 319.1  | 269.0  | 209.8  | 166.1  | 160.9  |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

LM-79-2008: Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Report Prepared for

Cooper Lighting Solutions

McGRAW-EDISON

Report Number: SP1-1908-441-4-R4

Test Date: 10/02/2019

Luminaire Tested: SA1C-750-U-5WQ

Data in this report applies to families of products SA1C-760-U-5WQ .

### Test Information

Test Method: LM-79-2008  
 Report Number: SP1-1908-441-4-R4  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry:  $4\pi$   
 Issue Date: 10/28/2024  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: MCGRAW-EDISON  
 Catalog Number: **SA1C-750-U-5WQ**  
 Description: MCGRAW EDISON ROADWAY AND AREA LUMINAIRE

\*\*\*THIS IS A REVISION OF SP1-1908-441-4-R3. TO UPDATE THE CATALOG INFORMATION.\*\*\*TESTED IN SITU. ROADWAY AND AREA LUMINAIRE. (1) 70 CRI, 5000K, 1050MA LIGHTSQUARE WITH 16 LEDS AND TYPE V WIDE OPTICS.

### Spectral Parameters

|                           |        |           |      |      |       |
|---------------------------|--------|-----------|------|------|-------|
| CCT (K):                  | 4884   | CRI (Ra): | 73.5 |      |       |
| CIE u':                   | 0.2101 | R1:       | 70.5 | R9:  | -28.4 |
| CIE v':                   | 0.4904 | R2:       | 77.7 | R10: | 48.6  |
| Duv:                      | 0.0037 | R3:       | 84.6 | R11: | 73.2  |
| CIE x:                    | 0.3493 | R4:       | 74.7 | R12: | 50.7  |
| CIE y:                    | 0.3624 | R5:       | 71.9 | R13: | 71.2  |
| CIE z:                    | 0.2884 | R6:       | 70.7 | R14: | 91.4  |
| Peak Wavelength (nm):     | 444    | R7:       | 81.2 |      |       |
| Dominant Wavelength (nm): | 571    | R8:       | 56.9 |      |       |
| Purity:                   | 13.7   |           |      |      |       |
| Rf:                       | 74.9   |           |      |      |       |
| Rg:                       | 96.3   |           |      |      |       |



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| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | IN0058                | 6/28/2019        | 12/28/2019           |
| Power Meter                    | IN0071                | 12/5/2018        | 12/5/2019            |
| AC Power Source                | IN0063                | 12/5/2018        | 12/5/2019            |
| DC Power Source                | IN0208                | 12/5/2018        | 12/5/2019            |
| Sphere Thermometer             | IN0085                | 12/5/2018        | 12/5/2019            |
| Room Thermometer               | IN0046                | 12/5/2018        | 12/5/2019            |

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**CIE 1931 Chromaticity Diagram**



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



Point lies inside the ANSI 5000K 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       | 2945             | NR               | 490       | 37941            | NR               | 620       | 88803            | NR               | 750       | 3908             | NR               | 880       | 2997             | NR               |
| 365       | 2596             | NR               | 495       | 48525            | NR               | 625       | 80578            | NR               | 755       | 3988             | NR               | 885       | 2927             | NR               |
| 370       | 2732             | NR               | 500       | 60609            | NR               | 630       | 73127            | NR               | 760       | 3335             | NR               | 890       | 2649             | NR               |
| 375       | 2894             | NR               | 505       | 72036            | NR               | 635       | 66244            | NR               | 765       | 3438             | NR               | 895       | 2828             | NR               |
| 380       | 2822             | NR               | 510       | 82168            | NR               | 640       | 59440            | NR               | 770       | 3427             | NR               | 900       | 1407             | NR               |
| 385       | 2394             | NR               | 515       | 90898            | NR               | 645       | 52864            | NR               | 775       | 2759             | NR               | 905       | 2224             | NR               |
| 390       | 2370             | NR               | 520       | 97142            | NR               | 650       | 47085            | NR               | 780       | 2340             | NR               | 910       | 2905             | NR               |
| 395       | 2267             | NR               | 525       | 103255           | NR               | 655       | 41789            | NR               | 785       | 2412             | NR               | 915       | 3350             | NR               |
| 400       | 2262             | NR               | 530       | 106697           | NR               | 660       | 37064            | NR               | 790       | 1999             | NR               | 920       | 3114             | NR               |
| 405       | 3000             | NR               | 535       | 110081           | NR               | 665       | 32299            | NR               | 795       | 2054             | NR               | 925       | 2834             | NR               |
| 410       | 5324             | NR               | 540       | 112494           | NR               | 670       | 28142            | NR               | 800       | 2331             | NR               | 930       | 2271             | NR               |
| 415       | 10725            | NR               | 545       | 115513           | NR               | 675       | 24505            | NR               | 805       | 2648             | NR               | 935       | 2228             | NR               |
| 420       | 22128            | NR               | 550       | 117203           | NR               | 680       | 21162            | NR               | 810       | 2485             | NR               | 940       | 2833             | NR               |
| 425       | 44095            | NR               | 555       | 119753           | NR               | 685       | 18400            | NR               | 815       | 2409             | NR               | 945       | 2941             | NR               |
| 430       | 77002            | NR               | 560       | 122602           | NR               | 690       | 16065            | NR               | 820       | 2221             | NR               | 950       | 2323             | NR               |
| 435       | 119881           | NR               | 565       | 124314           | NR               | 695       | 13860            | NR               | 825       | 1562             | NR               | 955       | 1667             | NR               |
| 440       | 164454           | NR               | 570       | 126775           | NR               | 700       | 12177            | NR               | 830       | 2249             | NR               | 960       | 749              | NR               |
| 445       | 179997           | NR               | 575       | 127511           | NR               | 705       | 10757            | NR               | 835       | 2573             | NR               | 965       | 2669             | NR               |
| 450       | 142822           | NR               | 580       | 127577           | NR               | 710       | 9601             | NR               | 840       | 2764             | NR               | 970       | 3968             | NR               |
| 455       | 90008            | NR               | 585       | 126153           | NR               | 715       | 8944             | NR               | 845       | 3109             | NR               | 975       | 3886             | NR               |
| 460       | 60557            | NR               | 590       | 123678           | NR               | 720       | 7947             | NR               | 850       | 2963             | NR               | 980       | 2788             | NR               |
| 465       | 43305            | NR               | 595       | 119774           | NR               | 725       | 7062             | NR               | 855       | 2336             | NR               | 985       | 3496             | NR               |
| 470       | 31089            | NR               | 600       | 115733           | NR               | 730       | 6004             | NR               | 860       | 2118             | NR               | 990       | 2913             | NR               |
| 475       | 26278            | NR               | 605       | 109231           | NR               | 735       | 5594             | NR               | 865       | 3144             | NR               | 995       | 4659             | NR               |
| 480       | 27060            | NR               | 610       | 102408           | NR               | 740       | 5165             | NR               | 870       | 3069             | NR               | 1000      | 1308             | NR               |
| 485       | 30698            | NR               | 615       | 96015            | NR               | 745       | 4687             | NR               | 875       | 3311             | NR               |           |                  |                  |

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Scotopic Flux vs. Wavelength



Scotopic Lumens: 13493.5

S/P: 1.77

| 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       | 2945             | NR               | 490       | 37941            | NR               | 620       | 88803            | NR               | 750       | 3908             | NR               | 880       | 2997             | NR               |
| 365       | 2596             | NR               | 495       | 48525            | NR               | 625       | 80578            | NR               | 755       | 3988             | NR               | 885       | 2927             | NR               |
| 370       | 2732             | NR               | 500       | 60609            | NR               | 630       | 73127            | NR               | 760       | 3335             | NR               | 890       | 2649             | NR               |
| 375       | 2894             | NR               | 505       | 72036            | NR               | 635       | 66244            | NR               | 765       | 3438             | NR               | 895       | 2828             | NR               |
| 380       | 2822             | NR               | 510       | 82168            | NR               | 640       | 59440            | NR               | 770       | 3427             | NR               | 900       | 1407             | NR               |
| 385       | 2394             | NR               | 515       | 90898            | NR               | 645       | 52864            | NR               | 775       | 2759             | NR               | 905       | 2224             | NR               |
| 390       | 2370             | NR               | 520       | 97142            | NR               | 650       | 47085            | NR               | 780       | 2340             | NR               | 910       | 2905             | NR               |
| 395       | 2267             | NR               | 525       | 103255           | NR               | 655       | 41789            | NR               | 785       | 2412             | NR               | 915       | 3350             | NR               |
| 400       | 2262             | NR               | 530       | 106697           | NR               | 660       | 37064            | NR               | 790       | 1999             | NR               | 920       | 3114             | NR               |
| 405       | 3000             | NR               | 535       | 110081           | NR               | 665       | 32299            | NR               | 795       | 2054             | NR               | 925       | 2834             | NR               |
| 410       | 5324             | NR               | 540       | 112494           | NR               | 670       | 28142            | NR               | 800       | 2331             | NR               | 930       | 2271             | NR               |
| 415       | 10725            | NR               | 545       | 115513           | NR               | 675       | 24505            | NR               | 805       | 2648             | NR               | 935       | 2228             | NR               |
| 420       | 22128            | NR               | 550       | 117203           | NR               | 680       | 21162            | NR               | 810       | 2485             | NR               | 940       | 2833             | NR               |
| 425       | 44095            | NR               | 555       | 119753           | NR               | 685       | 18400            | NR               | 815       | 2409             | NR               | 945       | 2941             | NR               |
| 430       | 77002            | NR               | 560       | 122602           | NR               | 690       | 16065            | NR               | 820       | 2221             | NR               | 950       | 2323             | NR               |
| 435       | 119881           | NR               | 565       | 124314           | NR               | 695       | 13860            | NR               | 825       | 1562             | NR               | 955       | 1667             | NR               |
| 440       | 164454           | NR               | 570       | 126775           | NR               | 700       | 12177            | NR               | 830       | 2249             | NR               | 960       | 749              | NR               |
| 445       | 179997           | NR               | 575       | 127511           | NR               | 705       | 10757            | NR               | 835       | 2573             | NR               | 965       | 2669             | NR               |
| 450       | 142822           | NR               | 580       | 127577           | NR               | 710       | 9601             | NR               | 840       | 2764             | NR               | 970       | 3968             | NR               |
| 455       | 90008            | NR               | 585       | 126153           | NR               | 715       | 8944             | NR               | 845       | 3109             | NR               | 975       | 3886             | NR               |
| 460       | 60557            | NR               | 590       | 123678           | NR               | 720       | 7947             | NR               | 850       | 2963             | NR               | 980       | 2788             | NR               |
| 465       | 43305            | NR               | 595       | 119774           | NR               | 725       | 7062             | NR               | 855       | 2336             | NR               | 985       | 3496             | NR               |
| 470       | 31089            | NR               | 600       | 115733           | NR               | 730       | 6004             | NR               | 860       | 2118             | NR               | 990       | 2913             | NR               |
| 475       | 26278            | NR               | 605       | 109231           | NR               | 735       | 5594             | NR               | 865       | 3144             | NR               | 995       | 4659             | NR               |
| 480       | 27060            | NR               | 610       | 102408           | NR               | 740       | 5165             | NR               | 870       | 3069             | NR               | 1000      | 1308             | NR               |
| 485       | 30698            | NR               | 615       | 96015            | NR               | 745       | 4687             | NR               | 875       | 3311             | NR               |           |                  |                  |

REPORT NUMBER: SP1-1908-441-4-R4

**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: 5378.9**

**M/P: 0.71**

| 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       | 2945             | NR               | 490       | 37941            | NR               | 620       | 88803            | NR               | 750       | 3908             | NR               | 880       | 2997             | NR               |
| 365       | 2596             | NR               | 495       | 48525            | NR               | 625       | 80578            | NR               | 755       | 3988             | NR               | 885       | 2927             | NR               |
| 370       | 2732             | NR               | 500       | 60609            | NR               | 630       | 73127            | NR               | 760       | 3335             | NR               | 890       | 2649             | NR               |
| 375       | 2894             | NR               | 505       | 72036            | NR               | 635       | 66244            | NR               | 765       | 3438             | NR               | 895       | 2828             | NR               |
| 380       | 2822             | NR               | 510       | 82168            | NR               | 640       | 59440            | NR               | 770       | 3427             | NR               | 900       | 1407             | NR               |
| 385       | 2394             | NR               | 515       | 90898            | NR               | 645       | 52864            | NR               | 775       | 2759             | NR               | 905       | 2224             | NR               |
| 390       | 2370             | NR               | 520       | 97142            | NR               | 650       | 47085            | NR               | 780       | 2340             | NR               | 910       | 2905             | NR               |
| 395       | 2267             | NR               | 525       | 103255           | NR               | 655       | 41789            | NR               | 785       | 2412             | NR               | 915       | 3350             | NR               |
| 400       | 2262             | NR               | 530       | 106697           | NR               | 660       | 37064            | NR               | 790       | 1999             | NR               | 920       | 3114             | NR               |
| 405       | 3000             | NR               | 535       | 110081           | NR               | 665       | 32299            | NR               | 795       | 2054             | NR               | 925       | 2834             | NR               |
| 410       | 5324             | NR               | 540       | 112494           | NR               | 670       | 28142            | NR               | 800       | 2331             | NR               | 930       | 2271             | NR               |
| 415       | 10725            | NR               | 545       | 115513           | NR               | 675       | 24505            | NR               | 805       | 2648             | NR               | 935       | 2228             | NR               |
| 420       | 22128            | NR               | 550       | 117203           | NR               | 680       | 21162            | NR               | 810       | 2485             | NR               | 940       | 2833             | NR               |
| 425       | 44095            | NR               | 555       | 119753           | NR               | 685       | 18400            | NR               | 815       | 2409             | NR               | 945       | 2941             | NR               |
| 430       | 77002            | NR               | 560       | 122602           | NR               | 690       | 16065            | NR               | 820       | 2221             | NR               | 950       | 2323             | NR               |
| 435       | 119881           | NR               | 565       | 124314           | NR               | 695       | 13860            | NR               | 825       | 1562             | NR               | 955       | 1667             | NR               |
| 440       | 164454           | NR               | 570       | 126775           | NR               | 700       | 12177            | NR               | 830       | 2249             | NR               | 960       | 749              | NR               |
| 445       | 179997           | NR               | 575       | 127511           | NR               | 705       | 10757            | NR               | 835       | 2573             | NR               | 965       | 2669             | NR               |
| 450       | 142822           | NR               | 580       | 127577           | NR               | 710       | 9601             | NR               | 840       | 2764             | NR               | 970       | 3968             | NR               |
| 455       | 90008            | NR               | 585       | 126153           | NR               | 715       | 8944             | NR               | 845       | 3109             | NR               | 975       | 3886             | NR               |
| 460       | 60557            | NR               | 590       | 123678           | NR               | 720       | 7947             | NR               | 850       | 2963             | NR               | 980       | 2788             | NR               |
| 465       | 43305            | NR               | 595       | 119774           | NR               | 725       | 7062             | NR               | 855       | 2336             | NR               | 985       | 3496             | NR               |
| 470       | 31089            | NR               | 600       | 115733           | NR               | 730       | 6004             | NR               | 860       | 2118             | NR               | 990       | 2913             | NR               |
| 475       | 26278            | NR               | 605       | 109231           | NR               | 735       | 5594             | NR               | 865       | 3144             | NR               | 995       | 4659             | NR               |
| 480       | 27060            | NR               | 610       | 102408           | NR               | 740       | 5165             | NR               | 870       | 3069             | NR               | 1000      | 1308             | NR               |
| 485       | 30698            | NR               | 615       | 96015            | NR               | 745       | 4687             | NR               | 875       | 3311             | NR               |           |                  |                  |

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**TM-30-18**

### Summary

$R_f = 74.9$   
 $R_g = 96.3$   
 CIE  $R_a = 73.5$   
 $R_g = -28.4$

### Spectral Power Distribution Comparison



### Color Vector Graphics



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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 61 | CES51 = 90 | CES76 = 52 |
| CES02 = 60 | CES27 = 84 | CES52 = 91 | CES77 = 71 |
| CES03 = 30 | CES28 = 81 | CES53 = 79 | CES78 = 54 |
| CES04 = 69 | CES29 = 58 | CES54 = 83 | CES79 = 80 |
| CES05 = 46 | CES30 = 67 | CES55 = 83 | CES80 = 77 |
| CES06 = 50 | CES31 = 63 | CES56 = 73 | CES81 = 77 |
| CES07 = 39 | CES32 = 59 | CES57 = 72 | CES82 = 90 |
| CES08 = 38 | CES33 = 69 | CES58 = 73 | CES83 = 86 |
| CES09 = 29 | CES34 = 69 | CES59 = 88 | CES84 = 88 |
| CES10 = 73 | CES35 = 83 | CES60 = 93 | CES85 = 84 |
| CES11 = 56 | CES36 = 95 | CES61 = 88 | CES86 = 75 |
| CES12 = 61 | CES37 = 78 | CES62 = 85 | CES87 = 78 |
| CES13 = 41 | CES38 = 76 | CES63 = 77 | CES88 = 79 |
| CES14 = 74 | CES39 = 93 | CES64 = 74 | CES89 = 75 |
| CES15 = 70 | CES40 = 86 | CES65 = 67 | CES90 = 77 |
| CES16 = 46 | CES41 = 87 | CES66 = 69 | CES91 = 89 |
| CES17 = 49 | CES42 = 78 | CES67 = 67 | CES92 = 66 |
| CES18 = 55 | CES43 = 75 | CES68 = 73 | CES93 = 80 |
| CES19 = 71 | CES44 = 99 | CES69 = 81 | CES94 = 57 |
| CES20 = 64 | CES45 = 83 | CES70 = 63 | CES95 = 71 |
| CES21 = 85 | CES46 = 81 | CES71 = 60 | CES96 = 78 |
| CES22 = 77 | CES47 = 80 | CES72 = 86 | CES97 = 85 |
| CES23 = 91 | CES48 = 72 | CES73 = 53 | CES98 = 75 |
| CES24 = 90 | CES49 = 81 | CES74 = 96 | CES99 = 62 |
| CES25 = 71 | CES50 = 89 | CES75 = 58 |            |



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Color Rendition by Hue-Angle Bin



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**Measure Comparisons**



(END OF REPORT)