

Indoor Distribution Test Report

Spectrum Lighting Inc.

994 Jefferson Street
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Spectrum Lighting Photometric Lab

Luminaire

CK0407PC 20L 35K MD xx NL xx MW
Nom. 4.5" Diam x 7"H Round Cylinder, Medium Beam

Test Number

SP-01439_M-20L

Test Date

11/23/2022

The results contained in this report pertain only to this IES file.

Summary of Results

Power

| | |
|-------------|--------|
| Input Watts | 13.2 W |
|-------------|--------|

Lumen Output

| | |
|---------------|-------------|
| Output Lumens | 1424 |
| Efficacy | 107.87 lm/W |

Luminous Dimensions

| | |
|-----------------|-------|
| 0° - 180° Size | -0.38 |
| 90° - 270° Size | -0.38 |
| Height | 0 |

Spacing Criterion

| | |
|---------------------------|------|
| Two luminaires, plane 0° | 0.48 |
| Two luminaires, plane 90° | 0.47 |
| Four luminaires | 0.49 |

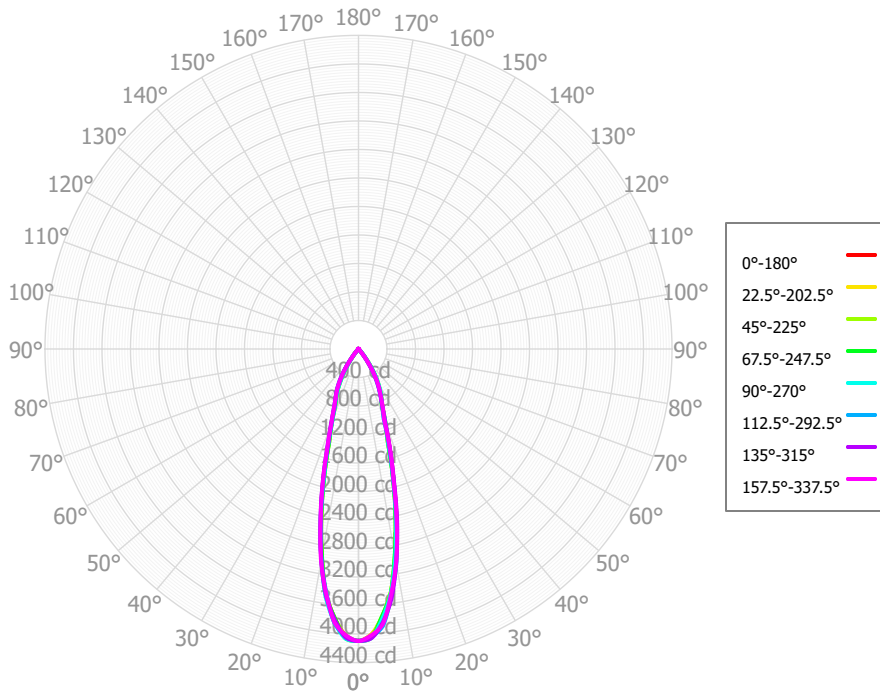
Full Beam Angle

| | |
|------------|-----|
| 0° - 180° | 29° |
| 90° - 270° | 29° |

IES File Header Contents

| Keyword | Value |
|-----------|---|
| TEST | SP-01439_M-20L |
| TESTLAB | Spectrum Lighting Photometric Lab, VLS-245-981 |
| MANUFAC | Spectrum Lighting |
| TESTDATE | 11/23/2022 |
| ISSUEDATE | 11/23/2022 |
| LUMCAT | CK0407PC 20L 35K MD xx NL xx MW |
| LUMINAIRE | Nom. 4.5" Diam x 7"H Round Cylinder, Medium Beam |
| OTHER | No lens, Matte White finish |
| OTHER | 28 Degree Beam Angle |
| OTHER | Reference Project SL378 |
| LAMP | N/A |
| LAMPCAT | N/A, Min. 80 CRI |
| OTHER | Total Luminaire Watts is approximate |
| OTHER | CCT Multipliers: 27K x 0.95, 30K x 0.97, 40K x 1.03 |
| OTHER | This report prepared by Spectrum Lighting |

Candela Polar Plot



Zonal Lumen Summary

| Zone | Lumens | % Fixture | Zone | Lumens | % Fixture |
|-----------------|---------|-----------|-------------------|---------|-----------|
| 0.00° - 10.00° | 341.68 | 24.00% | 90.00° - 100.00° | 2.10 | 0.15% |
| 10.00° - 20.00° | 518.30 | 36.40% | 100.00° - 110.00° | 1.98 | 0.14% |
| 20.00° - 30.00° | 346.04 | 24.30% | 100.00° - 120.00° | 3.85 | 0.27% |
| 30.00° - 40.00° | 166.06 | 11.66% | 120.00° - 130.00° | 1.68 | 0.12% |
| 40.00° - 50.00° | 18.52 | 1.30% | 130.00° - 140.00° | 1.54 | 0.11% |
| 50.00° - 60.00° | 7.01 | 0.49% | 140.00° - 150.00° | 1.41 | 0.10% |
| 60.00° - 70.00° | 6.97 | 0.49% | 150.00° - 160.00° | 1.04 | 0.07% |
| 70.00° - 80.00° | 4.27 | 0.30% | 160.00° - 170.00° | 0.65 | 0.05% |
| 80.00° - 90.00° | 2.53 | 0.18% | 170.00° - 180.00° | 0.20 | 0.01% |
| 0.00° - 90.00° | 1411.38 | 99.12% | 0.00° - 180.00° | 1423.87 | 100.00% |

Candela Distribution

| | 0.00° | 22.50° | 45.00° | 67.50° | 90.00° | 112.50° | 135.00° | 157.50° | 180.00° | 202.50° | 225.00° | 247.50° | 270.00° | 292.50° | 315.00° | 337.50° | 360.00° |
|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0.00° | 4096.67 | 4096.67 | 4096.67 | 4096.67 | 4096.67 | 4096.67 | 4096.67 | 4096.67 | 4096.67 | 4096.67 | 4096.67 | 4096.67 | 4096.67 | 4096.67 | 4096.67 | 4096.67 | 4096.67 |
| 2.50° | 4018.79 | 4015.35 | 4035.87 | 4060.73 | 4062.47 | 4037.70 | 4054.91 | 4023.88 | 4027.53 | 4042.60 | 4036.39 | 4068.43 | 4069.64 | 4045.45 | 4064.88 | 4024.72 | 4018.79 |
| 5.00° | 3824.37 | 3782.98 | 3770.53 | 3771.63 | 3808.08 | 3864.61 | 3815.37 | 3856.37 | 3809.33 | 3800.23 | 3800.41 | 3795.13 | 3853.40 | 3905.70 | 3861.19 | 3884.12 | 3824.37 |
| 7.50° | 3483.25 | 3453.66 | 3454.88 | 3464.99 | 3466.66 | 3454.15 | 3494.30 | 3465.92 | 3475.83 | 3482.18 | 3483.12 | 3498.37 | 3516.12 | 3499.96 | 3538.18 | 3485.21 | 3483.25 |
| 10.00° | 3007.93 | 2957.28 | 2941.69 | 2932.56 | 2968.45 | 3002.25 | 3005.73 | 3024.45 | 2998.24 | 2971.55 | 2960.59 | 2953.54 | 3001.61 | 3058.99 | 3041.96 | 3047.27 | 3007.93 |
| 12.50° | 2473.50 | 2433.61 | 2400.21 | 2399.65 | 2419.71 | 2441.36 | 2461.52 | 2460.08 | 2439.55 | 2410.13 | 2425.37 | 2408.13 | 2457.19 | 2467.44 | 2506.25 | 2476.83 | 2473.50 |
| 15.00° | 1895.19 | 1872.64 | 1878.03 | 1863.38 | 1900.35 | 1913.29 | 1941.37 | 1930.51 | 1913.72 | 1885.98 | 1865.41 | 1859.25 | 1877.81 | 1865.98 | 1924.75 | 1894.92 | 1895.19 |
| 17.50° | 1448.85 | 1423.93 | 1357.31 | 1373.21 | 1387.97 | 1451.65 | 1427.03 | 1467.02 | 1402.56 | 1368.58 | 1402.12 | 1363.74 | 1419.82 | 1438.36 | 1458.51 | 1466.23 | 1448.85 |
| 20.00° | 1080.32 | 1099.78 | 1103.85 | 1094.53 | 1109.34 | 1093.59 | 1134.82 | 1108.54 | 1102.54 | 1099.42 | 1089.64 | 1085.96 | 1077.23 | 1024.39 | 1100.92 | 1049.64 | 1080.32 |
| 22.50° | 875.60 | 881.16 | 859.84 | 856.82 | 867.78 | 902.87 | 879.53 | 909.82 | 874.15 | 858.40 | 863.95 | 848.82 | 860.72 | 874.92 | 873.89 | 892.80 | 875.60 |
| 25.00° | 747.69 | 756.40 | 757.53 | 753.11 | 758.88 | 754.80 | 764.28 | 755.75 | 748.08 | 746.05 | 746.12 | 734.57 | 741.54 | 728.63 | 745.35 | 739.79 | 747.69 |
| 27.50° | 632.53 | 640.42 | 653.84 | 648.29 | 662.33 | 661.54 | 662.43 | 655.84 | 647.28 | 639.88 | 624.61 | 615.00 | 616.82 | 612.12 | 621.06 | 629.35 | 632.53 |
| 30.00° | 521.94 | 530.77 | 535.80 | 540.67 | 546.64 | 550.54 | 538.17 | 539.48 | 522.31 | 510.58 | 499.37 | 483.04 | 488.68 | 492.93 | 499.32 | 515.17 | 521.94 |
| 32.50° | 392.54 | 403.76 | 416.24 | 425.65 | 430.04 | 421.01 | 412.98 | 407.10 | 393.19 | 381.33 | 370.28 | 352.91 | 357.62 | 358.77 | 370.12 | 377.55 | 392.54 |
| 35.00° | 258.07 | 266.83 | 287.54 | 296.34 | 299.10 | 294.10 | 283.50 | 279.79 | 266.32 | 253.15 | 238.06 | 226.13 | 225.15 | 231.81 | 237.35 | 245.75 | 258.07 |
| 37.50° | 154.88 | 161.44 | 169.35 | 182.68 | 172.54 | 169.40 | 158.41 | 156.46 | 139.68 | 133.21 | 138.65 | 125.64 | 132.24 | 132.38 | 141.00 | 138.79 | 154.88 |
| 40.00° | 57.51 | 70.37 | 93.47 | 93.24 | 98.46 | 88.42 | 87.69 | 80.88 | 82.20 | 76.39 | 60.72 | 62.90 | 54.23 | 53.29 | 58.22 | 52.69 | 57.51 |
| 42.50° | 31.70 | 33.87 | 33.11 | 36.65 | 32.31 | 37.07 | 24.89 | 35.78 | 28.27 | 27.58 | 27.44 | 25.11 | 27.07 | 32.46 | 29.17 | 31.02 | 31.70 |
| 45.00° | 14.34 | 16.26 | 19.20 | 20.58 | 19.93 | 15.09 | 16.89 | 16.39 | 18.00 | 18.74 | 17.19 | 16.34 | 14.41 | 16.87 | 14.95 | 14.72 | 14.34 |
| 47.50° | 11.33 | 10.96 | 9.08 | 10.91 | 9.46 | 8.83 | 9.96 | 9.93 | 8.36 | 11.55 | 12.59 | 11.75 | 11.19 | 12.90 | 11.51 | 11.17 | 11.33 |
| 50.00° | 9.09 | 8.78 | 7.67 | 7.65 | 7.52 | 6.79 | 7.91 | 8.11 | 7.22 | 10.31 | 10.27 | 11.12 | 9.85 | 10.10 | 10.15 | 8.43 | 9.09 |
| 52.50° | 7.84 | 7.72 | 6.69 | 6.54 | 5.99 | 6.52 | 6.30 | 8.09 | 6.36 | 9.30 | 9.60 | 10.18 | 9.64 | 9.35 | 9.56 | 7.17 | 7.84 |
| 55.00° | 6.66 | 6.86 | 6.44 | 7.15 | 5.84 | 6.54 | 6.18 | 7.39 | 7.57 | 8.92 | 9.44 | 9.00 | 9.58 | 9.18 | 9.07 | 6.44 | 6.66 |
| 57.50° | 6.56 | 7.15 | 6.37 | 7.32 | 5.87 | 6.65 | 6.30 | 6.49 | 8.52 | 8.45 | 9.44 | 8.58 | 9.13 | 9.81 | 7.99 | 6.49 | 6.56 |
| 60.00° | 6.51 | 7.57 | 6.54 | 7.21 | 6.35 | 6.57 | 7.05 | 6.45 | 8.28 | 7.83 | 9.49 | 8.61 | 8.66 | 9.22 | 6.87 | 6.88 | 6.51 |
| 62.50° | 6.80 | 8.13 | 6.66 | 6.53 | 6.57 | 6.44 | 7.47 | 6.58 | 8.00 | 7.61 | 8.22 | 8.60 | 8.92 | 7.25 | 7.69 | 7.67 | 6.80 |
| 65.00° | 6.95 | 8.66 | 6.71 | 5.56 | 6.29 | 6.49 | 7.25 | 6.92 | 7.54 | 8.01 | 6.76 | 8.58 | 9.12 | 6.39 | 8.36 | 7.49 | 6.95 |
| 67.50° | 6.38 | 7.12 | 6.48 | 5.72 | 5.81 | 6.56 | 6.75 | 7.28 | 6.82 | 7.63 | 5.99 | 7.66 | 8.08 | 6.53 | 6.41 | 6.36 | 6.38 |
| 70.00° | 5.66 | 5.65 | 5.96 | 6.33 | 5.07 | 5.68 | 5.83 | 6.22 | 5.45 | 6.21 | 5.27 | 6.41 | 6.98 | 5.80 | 4.59 | 5.43 | 5.66 |
| 72.50° | 4.46 | 5.22 | 5.01 | 5.29 | 4.45 | 4.70 | 5.11 | 5.07 | 4.30 | 5.03 | 3.97 | 5.02 | 5.28 | 4.44 | 3.94 | 4.64 | 4.46 |
| 75.00° | 3.44 | 4.76 | 3.74 | 3.76 | 4.00 | 3.93 | 4.64 | 4.12 | 3.59 | 4.10 | 2.70 | 3.60 | 3.76 | 3.44 | 3.32 | 4.05 | 3.44 |
| 77.50° | 2.92 | 4.12 | 2.95 | 3.55 | 3.49 | 3.17 | 4.12 | 3.19 | 3.18 | 3.28 | 2.95 | 3.31 | 3.30 | 2.66 | 2.84 | 3.57 | 2.92 |
| 80.00° | 2.52 | 3.44 | 2.45 | 3.63 | 2.92 | 2.96 | 3.55 | 2.67 | 3.24 | 2.56 | 3.11 | 3.24 | 2.81 | 2.29 | 2.43 | 2.95 | 2.52 |
| 82.50° | 2.37 | 2.58 | 2.22 | 3.19 | 2.88 | 2.72 | 2.97 | 2.20 | 3.16 | 2.20 | 2.31 | 2.48 | 2.24 | 2.12 | 2.27 | 2.26 | 2.37 |
| 85.00° | 2.23 | 1.90 | 2.11 | 2.66 | 3.27 | 2.24 | 2.40 | 2.21 | 2.90 | 2.09 | 1.67 | 1.64 | 1.92 | 2.02 | 2.08 | 2.00 | 2.23 |
| 87.50° | 2.15 | 1.88 | 1.99 | 2.38 | 2.83 | 1.81 | 2.28 | 2.21 | 2.51 | 1.97 | 2.00 | 1.59 | 2.33 | 1.95 | 1.81 | 1.90 | 2.15 |
| 90.00° | 2.01 | 1.85 | 1.87 | 2.12 | 1.86 | 1.80 | 2.44 | 2.18 | 1.99 | 1.83 | 2.21 | 1.59 | 2.55 | 1.84 | 1.64 | 1.87 | 2.01 |
| 92.50° | 1.81 | 1.77 | 1.88 | 1.91 | 1.59 | 1.86 | 2.39 | 2.13 | 1.88 | 1.86 | 1.96 | 1.87 | 2.37 | 1.74 | 1.69 | 1.85 | 1.81 |
| 95.00° | 1.83 | 1.78 | 1.92 | 1.71 | 1.66 | 2.29 | 2.22 | 2.04 | 2.11 | 1.96 | 1.76 | 2.12 | 2.15 | 1.75 | 1.72 | 1.84 | 1.83 |
| 97.50° | 2.08 | 1.96 | 2.02 | 1.93 | 1.69 | 2.51 | 1.95 | 1.96 | 2.01 | 2.04 | 1.75 | 1.72 | 1.87 | 1.79 | 1.71 | 1.84 | 2.08 |
| 100.00° | 2.42 | 2.03 | 2.13 | 2.11 | 1.71 | 2.06 | 1.64 | 1.89 | 1.71 | 2.11 | 1.73 | 1.34 | 1.77 | 2.05 | 1.68 | 1.79 | 2.42 |

CK0407PC 20L 35K MD xx NL xx MW

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Coefficients of Utilization – Zonal Cavity Method

Values are lumens delivered to the workplane.

| | | | | | | | | | | | | | | | | | | | |
|------------|------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| RCR | pfc | 20% | 20% | 20% | 20% | 20% | 20% | 20% | 20% | 20% | 20% | 20% | 20% | 20% | 20% | 20% | 20% | 20% | 0% |
| | pcc | 80% | 80% | 80% | 80% | 70% | 70% | 70% | 70% | 50% | 50% | 50% | 30% | 30% | 30% | 10% | 10% | 10% | 0% |
| | pw | 70% | 50% | 30% | 10% | 70% | 50% | 30% | 10% | 50% | 30% | 10% | 50% | 30% | 10% | 50% | 30% | 10% | 30% |
| | 0 | 1692 | 1692 | 1692 | 1692 | 1651 | 1651 | 1651 | 1651 | 1575 | 1575 | 1575 | 1505 | 1505 | 1505 | 1441 | 1441 | 1441 | 1411 |
| | 1 | 1624 | 1589 | 1557 | 1529 | 1588 | 1557 | 1529 | 1504 | 1497 | 1475 | 1455 | 1443 | 1426 | 1410 | 1393 | 1379 | 1367 | 1351 |
| | 2 | 1558 | 1498 | 1448 | 1406 | 1526 | 1473 | 1428 | 1390 | 1425 | 1389 | 1358 | 1382 | 1353 | 1327 | 1342 | 1318 | 1298 | 1292 |
| | 3 | 1495 | 1417 | 1357 | 1309 | 1468 | 1397 | 1342 | 1298 | 1359 | 1314 | 1276 | 1324 | 1286 | 1255 | 1292 | 1261 | 1234 | 1236 |
| | 4 | 1437 | 1346 | 1279 | 1229 | 1412 | 1330 | 1268 | 1221 | 1299 | 1247 | 1206 | 1270 | 1226 | 1191 | 1243 | 1206 | 1176 | 1184 |
| | 5 | 1381 | 1282 | 1212 | 1161 | 1359 | 1268 | 1203 | 1155 | 1243 | 1187 | 1144 | 1219 | 1171 | 1133 | 1197 | 1156 | 1123 | 1135 |
| | 6 | 1329 | 1223 | 1152 | 1101 | 1309 | 1212 | 1146 | 1097 | 1191 | 1133 | 1089 | 1171 | 1120 | 1081 | 1153 | 1108 | 1074 | 1089 |
| | 7 | 1280 | 1170 | 1099 | 1049 | 1262 | 1161 | 1094 | 1046 | 1143 | 1084 | 1040 | 1126 | 1074 | 1034 | 1111 | 1064 | 1028 | 1046 |
| | 8 | 1234 | 1122 | 1051 | 1003 | 1218 | 1114 | 1047 | 1000 | 1099 | 1039 | 996 | 1084 | 1030 | 991 | 1071 | 1023 | 987 | 1007 |
| | 9 | 1191 | 1077 | 1008 | 961 | 1176 | 1070 | 1004 | 959 | 1057 | 997 | 955 | 1045 | 991 | 952 | 1033 | 984 | 948 | 969 |
| | 10 | 1150 | 1036 | 968 | 922 | 1137 | 1030 | 965 | 921 | 1019 | 959 | 918 | 1008 | 954 | 915 | 998 | 948 | 913 | 935 |

Cone of Light

| Mtg Height | Light Level | Beam Diameter |
|------------|-------------|---------------|
| 5.5 ft | 135.4 fc | 2.8 ft |
| 6.5 ft | 97.0 fc | 3.3 ft |
| 7.5 ft | 72.8 fc | 3.8 ft |
| 8.0 ft | 64.0 fc | 4.1 ft |
| 10.0 ft | 41.0 fc | 5.1 ft |
| 12.0 ft | 28.4 fc | 6.1 ft |
| 14.0 ft | 20.9 fc | 7.2 ft |
| 16.0 ft | 16.0 fc | 8.2 ft |
| 20.0 ft | 10.2 fc | 10.2 ft |
| 24.0 ft | 7.1 fc | 12.3 ft |
| 28.0 ft | 5.2 fc | 14.3 ft |

Average Luminaire Luminance [cd/m²]

| | 0.00° | 45.00° | 90.00° |
|---------------|--------|--------|--------|
| 0.00° | 388816 | 388816 | 388816 |
| 45.00° | 1924 | 2578 | 2675 |
| 55.00° | 1102 | 1066 | 966 |
| 65.00° | 1561 | 1508 | 1412 |
| 75.00° | 1260 | 1370 | 1469 |
| 85.00° | 2432 | 2300 | 3565 |

UGR CIE 190:2010

| Ceiling reflectance | | 0.7 | 0.7 | 0.5 | 0.5 | 0.3 | 0.7 | 0.7 | 0.5 | 0.5 | 0.3 |
|---------------------|-----|------------------|-----|-----|-----|-----|----------------|-----|-----|-----|------|
| Wall reflectance | | 0.5 | 0.3 | 0.5 | 0.3 | 0.3 | 0.5 | 0.3 | 0.5 | 0.3 | 0.3 |
| Plane reflectance | | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| Room dimensions | | Viewed crosswise | | | | | Viewed endwise | | | | |
| 2H | 2H | 0.6 | 1.5 | 0.9 | 1.8 | 2.1 | 1.4 | 2.3 | 1.8 | 2.6 | 3.0 |
| | 3H | 3.6 | 4.4 | 4.0 | 4.8 | 5.2 | 4.3 | 5.1 | 4.7 | 5.4 | 5.8 |
| | 4H | 4.5 | 5.2 | 4.9 | 5.6 | 6.0 | 5.0 | 5.8 | 5.4 | 6.1 | 6.5 |
| | 6H | 5.1 | 5.8 | 5.6 | 6.2 | 6.6 | 5.7 | 6.3 | 6.1 | 6.7 | 7.2 |
| | 8H | 5.5 | 6.1 | 5.9 | 6.5 | 7.0 | 6.0 | 6.7 | 6.5 | 7.1 | 7.5 |
| | 12H | 5.9 | 6.5 | 6.4 | 6.9 | 7.4 | 6.5 | 7.1 | 7.0 | 7.5 | 8.0 |
| 4H | 2H | 1.8 | 2.6 | 2.3 | 2.9 | 3.4 | 2.3 | 3.0 | 2.7 | 3.4 | 3.8 |
| | 3H | 4.7 | 5.3 | 5.1 | 5.7 | 6.1 | 5.1 | 5.7 | 5.6 | 6.2 | 6.6 |
| | 4H | 5.7 | 6.2 | 6.1 | 6.7 | 7.1 | 5.9 | 6.5 | 6.4 | 6.9 | 7.4 |
| | 6H | 6.5 | 7.0 | 7.0 | 7.5 | 8.0 | 6.7 | 7.2 | 7.2 | 7.7 | 8.2 |
| | 8H | 6.9 | 7.4 | 7.4 | 7.8 | 8.3 | 7.2 | 7.6 | 7.7 | 8.1 | 8.6 |
| | 12H | 7.4 | 7.8 | 7.9 | 8.3 | 8.8 | 7.8 | 8.1 | 8.3 | 8.6 | 9.1 |
| 8H | 4H | 5.9 | 6.4 | 6.4 | 6.8 | 7.3 | 6.2 | 6.7 | 6.7 | 7.1 | 7.6 |
| | 6H | 7.0 | 7.4 | 7.6 | 7.9 | 8.4 | 7.3 | 7.6 | 7.8 | 8.1 | 8.6 |
| | 8H | 7.6 | 7.9 | 8.1 | 8.4 | 8.9 | 7.9 | 8.2 | 8.4 | 8.7 | 9.2 |
| | 12H | 8.2 | 8.5 | 8.8 | 9.0 | 9.6 | 8.6 | 8.9 | 9.2 | 9.4 | 10.0 |
| 12H | 4H | 6.0 | 6.3 | 6.5 | 6.8 | 7.3 | 6.2 | 6.6 | 6.8 | 7.1 | 7.6 |
| | 6H | 7.1 | 7.4 | 7.7 | 7.9 | 8.5 | 7.4 | 7.7 | 7.9 | 8.2 | 8.8 |
| | 8H | 7.7 | 8.0 | 8.3 | 8.5 | 9.1 | 8.1 | 8.3 | 8.6 | 8.8 | 9.4 |

Corrected UGR values based on total output energy
 SHR = 1.0

Corrected UGR values based on total output lumens

SHR = 1.0