

Cooper Lighting Solutions Photometric Lab  
1121 Highway 74 South  
Peachtree City, GA 30269



Scaled data based on original data using  
LM-79-2019 Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Test Report Prepared for  
Cooper Lighting Solutions

Brand: NEO-RAY

Report Number: P911681

Luminaire Tested: DFN2DIP-SQ2F0-040D040US850-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P911681  
REPORT IS A COMBINATION OF REPORTS P901305 AND P898215  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ2F0-040D040US850-FLLONL  
Description: 2 foot, Square Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

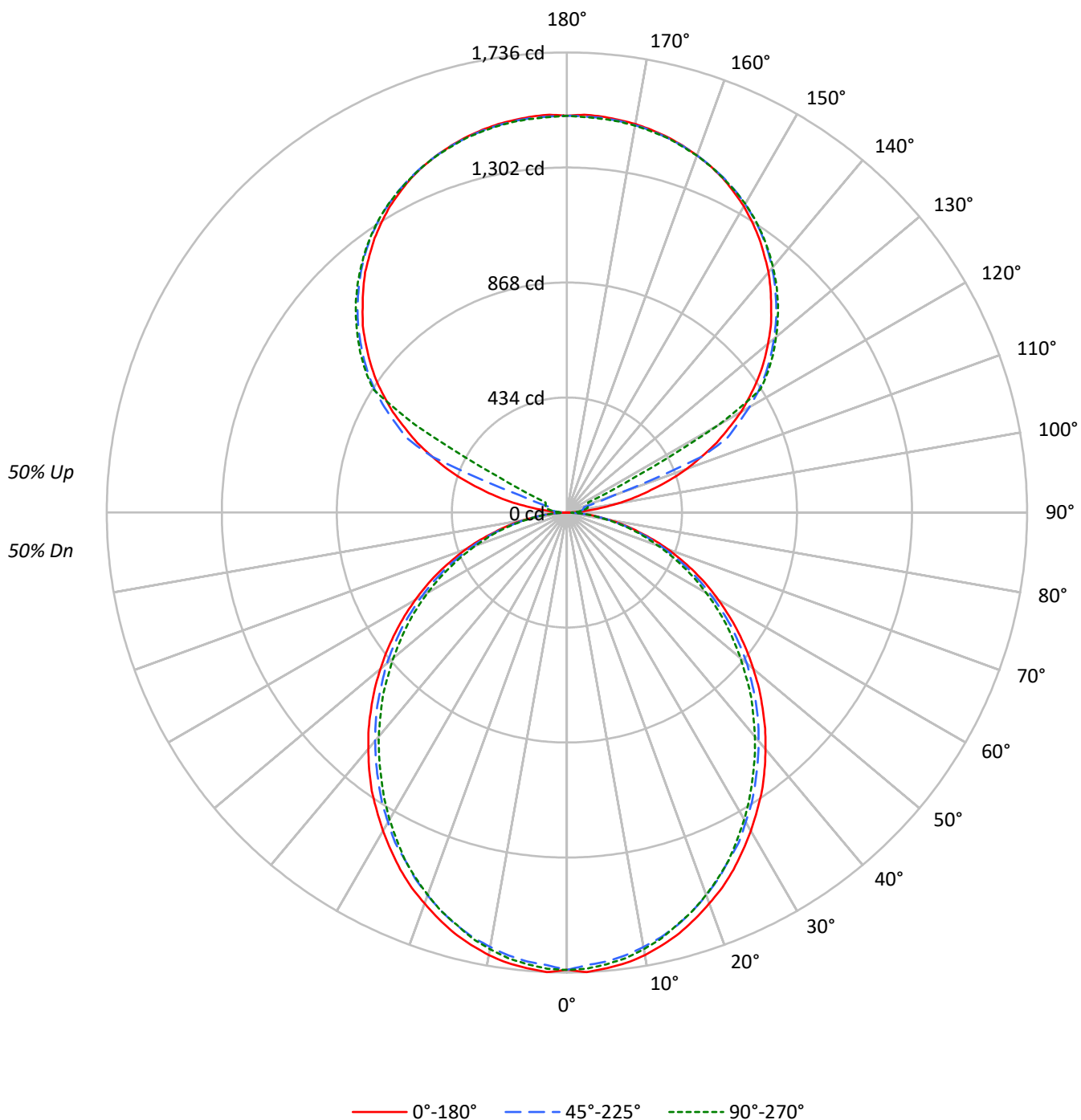
Lumens per Lamp: N/A  
Luminaire Lumens: 8783.3 lumens  
Efficiency: N/A  
Efficacy: 139.0 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 2.21' x L: 2.21' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 63.2  
Input Voltage (V): 120  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9952  
Total Harmonic Distortion (THDi): 0.069  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

TEST NUMBER: P911681

CATALOG NUMBER: DFN2DIP-SQ2F0-040D040US850-FLLONL

### Luminous Intensity Polar Plot



TEST NUMBER: P911681

CATALOG NUMBER: DFN2DIP-SQ2F0-040D040US850-FLLONL

**COEFFICIENT OF UTILIZATION - ZONAL CAVITY METHOD:**

|     |     |     |     |     |    |    |    |    |    |    |    |    |    |    |    |    |    |
|-----|-----|-----|-----|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| RF  | 20  |     |     |     | 20 |    |    |    | 20 |    |    |    | 20 |    |    |    | 20 |
| RC  | 80  |     |     |     | 70 |    |    |    | 50 |    |    |    | 30 |    |    |    | 10 |
| RW  | 70  | 50  | 30  | 10  | 70 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 |
| RCR |     |     |     |     |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 0   | 107 | 107 | 107 | 107 | 99 | 99 | 99 | 99 | 83 | 83 | 83 | 69 | 69 | 69 | 56 | 56 | 56 |
| 1   | 98  | 93  | 90  | 86  | 90 | 86 | 83 | 80 | 73 | 71 | 68 | 61 | 59 | 58 | 50 | 48 | 47 |
| 2   | 89  | 82  | 75  | 70  | 82 | 76 | 70 | 66 | 64 | 60 | 57 | 53 | 51 | 48 | 44 | 42 | 40 |
| 3   | 81  | 72  | 64  | 59  | 75 | 66 | 60 | 55 | 56 | 52 | 48 | 47 | 44 | 41 | 39 | 36 | 34 |
| 4   | 74  | 64  | 56  | 50  | 68 | 59 | 52 | 47 | 50 | 45 | 41 | 42 | 38 | 35 | 35 | 32 | 29 |
| 5   | 68  | 57  | 48  | 42  | 63 | 53 | 45 | 40 | 45 | 39 | 35 | 38 | 34 | 30 | 31 | 28 | 26 |
| 6   | 63  | 51  | 43  | 37  | 58 | 47 | 40 | 35 | 40 | 35 | 31 | 34 | 30 | 27 | 28 | 25 | 23 |
| 7   | 58  | 46  | 38  | 32  | 53 | 43 | 36 | 30 | 37 | 31 | 27 | 31 | 27 | 23 | 26 | 23 | 20 |
| 8   | 54  | 42  | 34  | 29  | 50 | 39 | 32 | 27 | 33 | 28 | 24 | 28 | 24 | 21 | 24 | 20 | 18 |
| 9   | 50  | 38  | 30  | 25  | 46 | 35 | 29 | 24 | 31 | 25 | 21 | 26 | 22 | 19 | 22 | 19 | 16 |
| 10  | 47  | 35  | 28  | 23  | 43 | 33 | 26 | 22 | 28 | 23 | 19 | 24 | 20 | 17 | 20 | 17 | 15 |

**AVERAGE LUMINANCE (cd/sqm):**

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3795 | 3795 | 3795 |
| 5°  | 3795 | 3734 | 3762 |
| 10° | 3758 | 3676 | 3706 |
| 15° | 3696 | 3607 | 3621 |
| 20° | 3614 | 3515 | 3535 |
| 25° | 3534 | 3406 | 3435 |
| 30° | 3434 | 3304 | 3310 |
| 35° | 3338 | 3186 | 3179 |
| 40° | 3222 | 3065 | 3053 |
| 45° | 3106 | 2945 | 2923 |
| 50° | 2979 | 2817 | 2774 |
| 55° | 2846 | 2671 | 2636 |
| 60° | 2694 | 2498 | 2478 |
| 65° | 2528 | 2317 | 2291 |
| 70° | 2316 | 2097 | 2089 |
| 75° | 2027 | 1833 | 1894 |
| 80° | 1673 | 1495 | 1539 |
| 85° | 1131 | 945  | 967  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
Vertical Angle: 45°  
Luminance: 3106 cd/sqm

TEST NUMBER: P911681

CATALOG NUMBER: DFN2DIP-SQ2F0-040D040US850-FLLONL

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 162.5  | 1.8       |
| 10°-20°   | 457.1  | 5.2       |
| 20°-30°   | 671.7  | 7.6       |
| 30°-40°   | 780.2  | 8.9       |
| 40°-50°   | 779.2  | 8.9       |
| 50°-60°   | 679.5  | 7.7       |
| 60°-70°   | 502.3  | 5.7       |
| 70°-80°   | 284.2  | 3.2       |
| 80°-90°   | 77.6   | 0.9       |
| 90°-100°  | 49.4   | 0.6       |
| 100°-110° | 184.0  | 2.1       |
| 110°-120° | 488.1  | 5.6       |
| 120°-130° | 809.5  | 9.2       |
| 130°-140° | 859.9  | 9.8       |
| 140°-150° | 799.2  | 9.1       |
| 150°-160° | 642.5  | 7.3       |
| 160°-170° | 414.0  | 4.7       |
| 170°-180° | 142.5  | 1.6       |
| 0°-30°    | 1291.3 | 14.7      |
| 0°-40°    | 2071.5 | 23.6      |
| 0°-60°    | 3530.2 | 40.2      |
| 0°-90°    | 4394.3 | 50.0      |
| 90°-120°  | 721.5  | 8.2       |
| 90°-150°  | 3190.0 | 36.3      |
| 90°-180°  | 4389.0 | 50.0      |
| 0°-180°   | 8783.3 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1726 | 1726  | 1726 | 1726  | 1726 |      |
| 5°   | 1726 | 1720  | 1701 | 1714  | 1711 | 164  |
| 15°  | 1643 | 1633  | 1612 | 1618  | 1610 | 463  |
| 25°  | 1487 | 1474  | 1446 | 1449  | 1446 | 684  |
| 35°  | 1283 | 1266  | 1240 | 1230  | 1222 | 801  |
| 45°  | 1044 | 1032  | 1007 | 989   | 983  | 806  |
| 55°  | 790  | 780   | 760  | 740   | 732  | 706  |
| 65°  | 533  | 523   | 506  | 491   | 483  | 527  |
| 75°  | 279  | 276   | 267  | 257   | 261  | 298  |
| 85°  | 68   | 66    | 65   | 60    | 58   | 76   |
| 90°  | 1    | 13    | 22   | 27    | 29   | 8    |
| 95°  | 70   | 35    | 42   | 48    | 47   | 83   |
| 105° | 329  | 362   | 66   | 78    | 82   | 352  |
| 115° | 623  | 641   | 668  | 167   | 89   | 613  |
| 125° | 881  | 895   | 915  | 923   | 926  | 785  |
| 135° | 1090 | 1107  | 1117 | 1128  | 1126 | 842  |
| 145° | 1264 | 1263  | 1281 | 1289  | 1284 | 791  |
| 155° | 1392 | 1382  | 1395 | 1402  | 1393 | 641  |
| 165° | 1467 | 1460  | 1464 | 1471  | 1464 | 414  |
| 175° | 1500 | 1493  | 1495 | 1502  | 1492 | 143  |
| 180° | 1497 | 1497  | 1497 | 1497  | 1497 |      |

TEST NUMBER: P911681

CATALOG NUMBER: DFN2DIP-SQ2F0-040D040US850-FLLONL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1726.0 | 1726.0 | 1726.0 | 1726.0 | 1726.0 |
| 2.5°   | 1736.1 | 1727.8 | 1709.5 | 1726.0 | 1722.9 |
| 5°     | 1726.0 | 1719.5 | 1701.2 | 1714.4 | 1711.3 |
| 7.5°   | 1714.4 | 1704.5 | 1686.2 | 1699.7 | 1696.3 |
| 10°    | 1696.3 | 1684.7 | 1664.8 | 1678.0 | 1673.0 |
| 12.5°  | 1671.3 | 1661.4 | 1641.5 | 1649.9 | 1646.4 |
| 15°    | 1643.1 | 1633.2 | 1611.6 | 1618.3 | 1610.0 |
| 17.5°  | 1608.3 | 1598.4 | 1576.8 | 1585.0 | 1576.8 |
| 20°    | 1570.0 | 1560.1 | 1537.0 | 1541.8 | 1535.4 |
| 22.5°  | 1532.0 | 1517.0 | 1495.4 | 1495.4 | 1492.0 |
| 25°    | 1487.1 | 1473.9 | 1445.7 | 1448.9 | 1445.7 |
| 27.5°  | 1437.3 | 1425.6 | 1404.2 | 1399.2 | 1391.0 |
| 30°    | 1387.6 | 1374.3 | 1349.4 | 1344.4 | 1337.8 |
| 32.5°  | 1334.5 | 1324.6 | 1298.0 | 1288.0 | 1281.2 |
| 35°    | 1283.0 | 1266.5 | 1239.9 | 1229.9 | 1221.6 |
| 37.5°  | 1224.9 | 1209.9 | 1183.3 | 1171.8 | 1163.5 |
| 40°    | 1165.2 | 1151.8 | 1125.2 | 1110.4 | 1103.8 |
| 42.5°  | 1107.1 | 1093.7 | 1067.3 | 1050.6 | 1040.7 |
| 45°    | 1044.0 | 1032.5 | 1007.4 | 989.3  | 982.6  |
| 47.5°  | 982.6  | 970.9  | 944.4  | 926.1  | 916.3  |
| 50°    | 917.8  | 909.5  | 886.3  | 863.0  | 854.7  |
| 52.5°  | 854.7  | 843.2  | 821.7  | 803.4  | 791.7  |
| 55°    | 790.2  | 780.1  | 760.2  | 740.3  | 732.1  |
| 57.5°  | 725.3  | 717.1  | 695.3  | 675.5  | 668.8  |
| 60°    | 660.5  | 654.0  | 630.8  | 612.5  | 607.5  |
| 62.5°  | 597.5  | 585.9  | 569.4  | 552.7  | 546.1  |
| 65°    | 532.9  | 522.8  | 506.3  | 491.3  | 483.1  |
| 67.5°  | 466.4  | 458.0  | 443.3  | 431.6  | 425.0  |
| 70°    | 405.0  | 398.4  | 383.4  | 371.7  | 365.2  |
| 72.5°  | 342.0  | 335.3  | 327.0  | 315.4  | 310.4  |
| 75°    | 278.8  | 275.6  | 267.2  | 257.3  | 260.6  |
| 77.5°  | 222.4  | 215.7  | 212.4  | 207.4  | 202.5  |
| 80°    | 166.0  | 164.2  | 160.9  | 156.0  | 152.7  |
| 82.5°  | 112.9  | 112.9  | 111.3  | 104.6  | 104.6  |
| 85°    | 68.0   | 66.4   | 64.8   | 59.7   | 58.1   |
| 87.5°  | 29.9   | 26.6   | 23.3   | 18.3   | 16.5   |
| 90°    | 1.0    | 13.0   | 21.6   | 27.2   | 29.2   |
| 92.5°  | 27.2   | 22.7   | 26.0   | 28.2   | 29.2   |
| 95°    | 70.3   | 34.6   | 42.1   | 47.7   | 46.6   |
| 97.5°  | 126.8  | 37.9   | 55.2   | 58.6   | 59.6   |
| 100°   | 191.7  | 43.4   | 61.8   | 70.3   | 72.5   |
| 102.5° | 263.2  | 261.2  | 63.9   | 75.7   | 79.1   |
| 105°   | 329.3  | 361.9  | 66.1   | 78.0   | 82.3   |
| 107.5° | 406.2  | 433.3  | 68.3   | 80.2   | 84.5   |
| 110°   | 480.0  | 502.6  | 189.6  | 81.3   | 85.5   |

TEST NUMBER: P911681

CATALOG NUMBER: DFN2DIP-SQ2F0-040D040US850-FLLONL

**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 549.3  | 568.7  | 550.3  | 83.4   | 86.7   |
| 115°   | 622.8  | 641.2  | 668.4  | 166.8  | 88.9   |
| 117.5° | 686.8  | 708.4  | 726.9  | 571.9  | 288.1  |
| 120°   | 758.3  | 774.5  | 794.0  | 807.1  | 660.9  |
| 122.5° | 818.9  | 836.3  | 858.0  | 864.5  | 865.6  |
| 125°   | 880.7  | 894.9  | 915.4  | 923.0  | 926.2  |
| 127.5° | 937.0  | 952.2  | 968.5  | 979.4  | 980.4  |
| 130°   | 990.1  | 1007.5 | 1019.3 | 1031.3 | 1030.3 |
| 132.5° | 1044.2 | 1058.4 | 1070.3 | 1080.1 | 1079.1 |
| 135°   | 1089.8 | 1107.2 | 1116.9 | 1127.7 | 1125.6 |
| 137.5° | 1137.4 | 1150.4 | 1161.3 | 1172.1 | 1168.9 |
| 140°   | 1184.0 | 1192.7 | 1204.6 | 1214.4 | 1208.9 |
| 142.5° | 1223.1 | 1230.7 | 1244.7 | 1253.3 | 1248.0 |
| 145°   | 1264.3 | 1263.2 | 1281.4 | 1289.1 | 1283.7 |
| 147.5° | 1299.9 | 1296.6 | 1315.1 | 1320.5 | 1316.3 |
| 150°   | 1334.6 | 1327.0 | 1344.4 | 1350.9 | 1345.4 |
| 152.5° | 1363.8 | 1355.2 | 1371.4 | 1377.9 | 1370.4 |
| 155°   | 1392.0 | 1382.4 | 1395.3 | 1401.8 | 1393.1 |
| 157.5° | 1414.8 | 1406.1 | 1416.0 | 1423.5 | 1414.8 |
| 160°   | 1434.3 | 1427.7 | 1434.3 | 1440.7 | 1433.2 |
| 162.5° | 1451.6 | 1445.1 | 1450.6 | 1458.1 | 1448.4 |
| 165°   | 1466.8 | 1460.3 | 1463.5 | 1471.1 | 1463.5 |
| 167.5° | 1478.7 | 1472.1 | 1475.5 | 1483.1 | 1473.3 |
| 170°   | 1488.5 | 1482.0 | 1484.1 | 1491.7 | 1482.0 |
| 172.5° | 1494.9 | 1488.5 | 1490.7 | 1498.3 | 1488.5 |
| 175°   | 1500.3 | 1492.7 | 1494.9 | 1502.5 | 1491.7 |
| 177.5° | 1502.5 | 1494.9 | 1496.0 | 1503.7 | 1493.9 |
| 180°   | 1497.2 | 1497.2 | 1497.2 | 1497.2 | 1497.2 |

TEST NUMBER: P911681

CATALOG NUMBER: DFN2DIP-SQ2F0-040D040US850-FLLONL

**CIE UGR TABLE:**

| Reflectances:   |      |                  |       |       |       |       |                |       |       |       |       |
|-----------------|------|------------------|-------|-------|-------|-------|----------------|-------|-------|-------|-------|
| Ceiling         |      | 0.7              | 0.7   | 0.5   | 0.5   | 0.3   | 0.7            | 0.7   | 0.5   | 0.5   | 0.3   |
| Wall            |      | 0.5              | 0.3   | 0.5   | 0.3   | 0.3   | 0.5            | 0.3   | 0.5   | 0.3   | 0.3   |
| Reference plane |      | 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 |       |       |       |       |
| X=2H            | Y=2H | 11.79            | 12.66 | 12.75 | 13.63 | 14.90 | 11.35          | 12.21 | 12.31 | 13.18 | 14.45 |
|                 | 3H   | 13.44            | 14.21 | 14.40 | 15.19 | 16.48 | 12.95          | 13.72 | 13.91 | 14.70 | 15.99 |
|                 | 4H   | 14.01            | 14.74 | 14.99 | 15.73 | 17.03 | 13.52          | 14.25 | 14.50 | 15.23 | 16.53 |
|                 | 6H   | 14.39            | 15.07 | 15.39 | 16.06 | 17.37 | 13.89          | 14.57 | 14.89 | 15.56 | 16.87 |
|                 | 8H   | 14.49            | 15.13 | 15.49 | 16.14 | 17.45 | 13.99          | 14.63 | 14.99 | 15.64 | 16.95 |
|                 | 12H  | 14.53            | 15.14 | 15.54 | 16.14 | 17.48 | 14.02          | 14.64 | 15.03 | 15.64 | 16.97 |
| 4H              | 2H   | 12.24            | 12.98 | 13.23 | 13.96 | 15.26 | 11.89          | 12.62 | 12.88 | 13.61 | 14.91 |
|                 | 3H   | 14.09            | 14.70 | 15.08 | 15.71 | 17.03 | 13.68          | 14.29 | 14.68 | 15.30 | 16.62 |
|                 | 4H   | 14.79            | 15.34 | 15.79 | 16.35 | 17.69 | 14.36          | 14.92 | 15.37 | 15.93 | 17.27 |
|                 | 6H   | 15.28            | 15.76 | 16.30 | 16.79 | 18.13 | 14.85          | 15.33 | 15.87 | 16.36 | 17.70 |
|                 | 8H   | 15.42            | 15.87 | 16.44 | 16.90 | 18.25 | 14.99          | 15.43 | 16.00 | 16.46 | 17.81 |
|                 | 12H  | 15.49            | 15.89 | 16.52 | 16.93 | 18.29 | 15.04          | 15.44 | 16.08 | 16.48 | 17.84 |
| 8H              | 4H   | 14.97            | 15.42 | 15.99 | 16.44 | 17.80 | 14.59          | 15.04 | 15.61 | 16.07 | 17.42 |
|                 | 6H   | 15.58            | 15.95 | 16.62 | 17.02 | 18.36 | 15.19          | 15.57 | 16.24 | 16.63 | 17.98 |
|                 | 8H   | 15.79            | 16.11 | 16.84 | 17.16 | 18.53 | 15.39          | 15.72 | 16.44 | 16.77 | 18.14 |
|                 | 12H  | 15.90            | 16.19 | 16.96 | 17.24 | 18.65 | 15.49          | 15.78 | 16.55 | 16.83 | 18.24 |
| 12H             | 4H   | 14.95            | 15.36 | 15.99 | 16.40 | 17.76 | 14.58          | 14.99 | 15.62 | 16.03 | 17.39 |
|                 | 6H   | 15.60            | 15.93 | 16.65 | 16.98 | 18.35 | 15.23          | 15.56 | 16.28 | 16.61 | 17.98 |
|                 | 8H   | 15.83            | 16.12 | 16.88 | 17.16 | 18.57 | 15.45          | 15.74 | 16.50 | 16.78 | 18.19 |