

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: P910537

Luminaire Tested: DFN2DIP-4P4F0-060D040US850-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P910537  
REPORT IS A COMBINATION OF REPORTS P900618 AND P897523  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-4P4F0-060D040US850-RLLONL  
Description: 4 foot, 90deg - 4way Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open  
No Lens  
Light Source: -  
Ballast/Driver: -

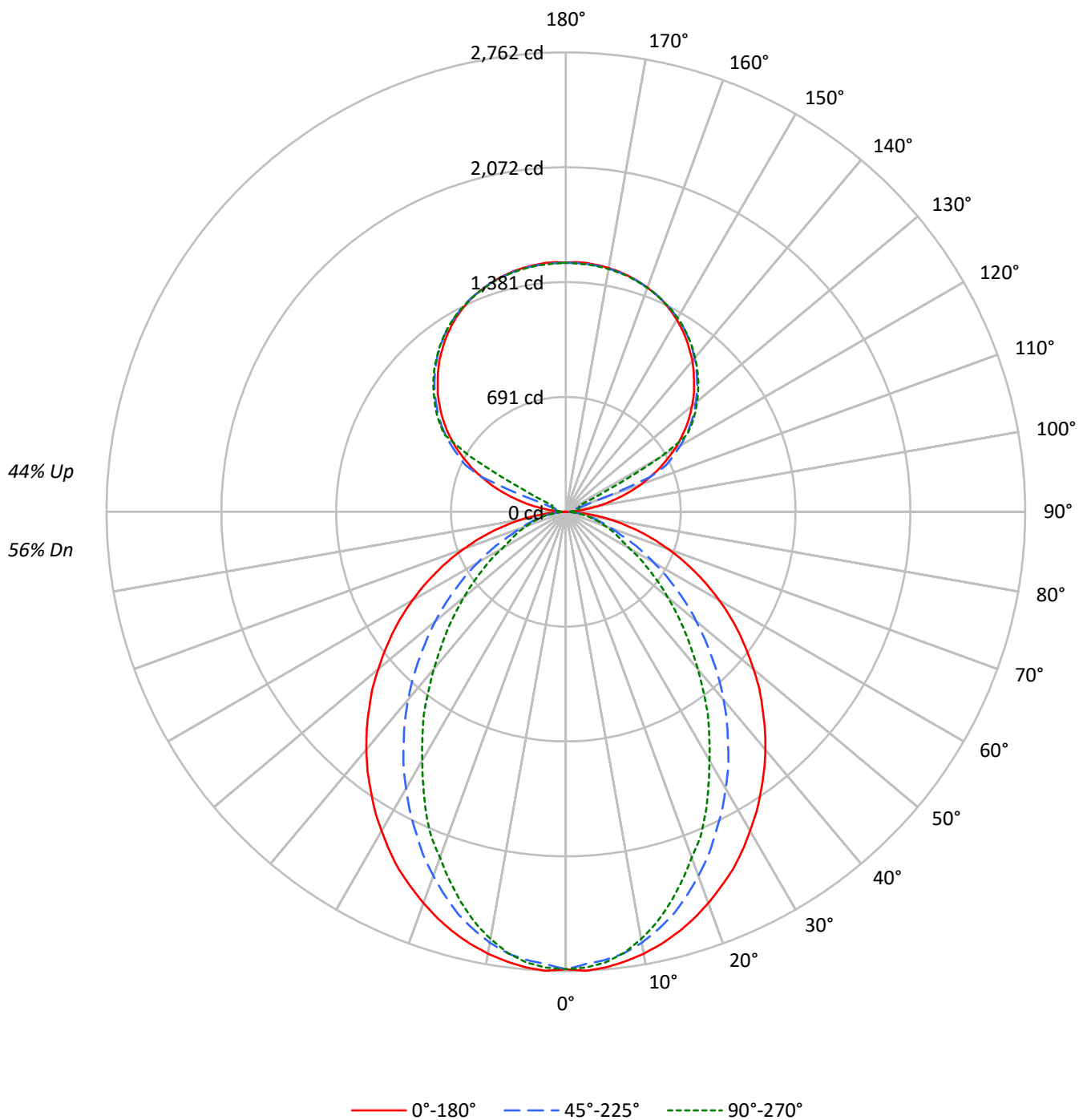
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 10047.6 lumens  
Efficiency: N/A  
Efficacy: 108.9 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 4.07' x L: 4.07' x H: 0.1')  
CIE Type: General Diffuse  
  
Input Watts (W): 92.3  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9933  
Total Harmonic Distortion (THDi): 0.066  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

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### Luminous Intensity Polar Plot



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**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   | 109 | 109 | 109 | 109 |  | 101 | 101 | 101 | 101 |  | 87 | 87 | 87 |  | 74 | 74 | 74 |  | 62 | 62 | 62 |
| 1   | 100 | 96  | 92  | 88  |  | 93  | 89  | 86  | 83  |  | 77 | 75 | 72 |  | 66 | 64 | 63 |  | 56 | 54 | 53 |
| 2   | 91  | 84  | 78  | 73  |  | 85  | 79  | 73  | 69  |  | 68 | 64 | 61 |  | 58 | 56 | 53 |  | 50 | 48 | 46 |
| 3   | 84  | 74  | 67  | 62  |  | 78  | 70  | 63  | 58  |  | 61 | 56 | 52 |  | 52 | 49 | 46 |  | 44 | 42 | 40 |
| 4   | 77  | 66  | 59  | 53  |  | 71  | 62  | 55  | 50  |  | 54 | 49 | 45 |  | 47 | 43 | 40 |  | 40 | 37 | 35 |
| 5   | 71  | 59  | 51  | 46  |  | 66  | 56  | 49  | 43  |  | 49 | 43 | 39 |  | 42 | 38 | 35 |  | 36 | 33 | 31 |
| 6   | 65  | 54  | 46  | 40  |  | 61  | 50  | 43  | 38  |  | 44 | 39 | 34 |  | 39 | 34 | 31 |  | 33 | 30 | 27 |
| 7   | 61  | 49  | 41  | 35  |  | 56  | 46  | 39  | 34  |  | 40 | 35 | 30 |  | 35 | 31 | 27 |  | 30 | 27 | 24 |
| 8   | 56  | 44  | 37  | 31  |  | 52  | 42  | 35  | 30  |  | 37 | 31 | 27 |  | 32 | 28 | 25 |  | 28 | 25 | 22 |
| 9   | 53  | 41  | 33  | 28  |  | 49  | 38  | 32  | 27  |  | 34 | 28 | 25 |  | 30 | 25 | 22 |  | 26 | 23 | 20 |
| 10  | 49  | 37  | 30  | 25  |  | 46  | 35  | 29  | 24  |  | 31 | 26 | 22 |  | 28 | 23 | 20 |  | 24 | 21 | 18 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1784 | 1784 | 1784 |
| 5°  | 1787 | 1756 | 1768 |
| 10° | 1770 | 1722 | 1711 |
| 15° | 1745 | 1666 | 1622 |
| 20° | 1713 | 1588 | 1514 |
| 25° | 1680 | 1501 | 1409 |
| 30° | 1636 | 1411 | 1276 |
| 35° | 1593 | 1314 | 1159 |
| 40° | 1549 | 1214 | 1024 |
| 45° | 1498 | 1103 | 903  |
| 50° | 1445 | 991  | 783  |
| 55° | 1390 | 872  | 669  |
| 60° | 1326 | 746  | 551  |
| 65° | 1252 | 619  | 497  |
| 70° | 1163 | 500  | 451  |
| 75° | 1051 | 442  | 412  |
| 80° | 889  | 372  | 359  |
| 85° | 621  | 252  | 274  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 1498 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 257.7   | 2.6       |
| 10°-20°   | 707.6   | 7.0       |
| 20°-30°   | 993.4   | 9.9       |
| 30°-40°   | 1082.8  | 10.8      |
| 40°-50°   | 995.2   | 9.9       |
| 50°-60°   | 781.6   | 7.8       |
| 60°-70°   | 508.8   | 5.1       |
| 70°-80°   | 261.9   | 2.6       |
| 80°-90°   | 69.5    | 0.7       |
| 90°-100°  | 49.4    | 0.5       |
| 100°-110° | 184.0   | 1.8       |
| 110°-120° | 488.1   | 4.9       |
| 120°-130° | 809.5   | 8.1       |
| 130°-140° | 859.9   | 8.6       |
| 140°-150° | 799.2   | 8.0       |
| 150°-160° | 642.5   | 6.4       |
| 160°-170° | 414.0   | 4.1       |
| 170°-180° | 142.5   | 1.4       |
| 0°-30°    | 1958.7  | 19.5      |
| 0°-40°    | 3041.5  | 30.3      |
| 0°-60°    | 4818.4  | 48.0      |
| 0°-90°    | 5658.6  | 56.3      |
| 90°-120°  | 721.5   | 7.2       |
| 90°-150°  | 3190.0  | 31.7      |
| 90°-180°  | 4389.0  | 43.7      |
| 0°-180°   | 10047.6 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2750 | 2750  | 2750 | 2750  | 2750 |      |
| 5°   | 2750 | 2738  | 2705 | 2728  | 2720 | 261  |
| 15°  | 2616 | 2588  | 2504 | 2456  | 2432 | 737  |
| 25°  | 2374 | 2295  | 2130 | 2028  | 1991 | 1092 |
| 35°  | 2046 | 1919  | 1700 | 1543  | 1488 | 1281 |
| 45°  | 1672 | 1506  | 1244 | 1068  | 1008 | 1292 |
| 55°  | 1272 | 1078  | 809  | 660   | 612  | 1136 |
| 65°  | 859  | 657   | 433  | 349   | 341  | 851  |
| 75°  | 458  | 284   | 199  | 182   | 179  | 484  |
| 85°  | 107  | 55    | 47   | 47    | 47   | 123  |
| 90°  | 1    | 13    | 22   | 27    | 29   | 9    |
| 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 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2750.1 | 2750.1 | 2750.1 | 2750.1 | 2750.1 |
| 2.5°   | 2762.5 | 2750.1 | 2722.6 | 2747.7 | 2742.7 |
| 5°     | 2750.1 | 2737.7 | 2705.2 | 2727.7 | 2720.3 |
| 7.5°   | 2727.7 | 2712.8 | 2678.0 | 2687.8 | 2675.4 |
| 10°    | 2697.8 | 2680.3 | 2630.8 | 2623.1 | 2608.3 |
| 12.5°  | 2660.6 | 2638.1 | 2570.8 | 2556.0 | 2528.5 |
| 15°    | 2615.7 | 2588.2 | 2503.7 | 2456.4 | 2431.6 |
| 17.5°  | 2563.5 | 2523.5 | 2419.0 | 2364.3 | 2324.5 |
| 20°    | 2503.7 | 2453.8 | 2329.5 | 2267.4 | 2212.5 |
| 22.5°  | 2439.0 | 2381.7 | 2237.3 | 2152.8 | 2115.5 |
| 25°    | 2374.4 | 2294.6 | 2130.4 | 2028.5 | 1991.0 |
| 27.5°  | 2297.3 | 2212.5 | 2030.8 | 1913.8 | 1856.6 |
| 30°    | 2215.1 | 2120.3 | 1921.2 | 1794.5 | 1727.2 |
| 32.5°  | 2135.4 | 2020.8 | 1817.0 | 1667.5 | 1605.2 |
| 35°    | 2045.9 | 1918.9 | 1700.0 | 1543.1 | 1488.2 |
| 37.5°  | 1958.7 | 1821.6 | 1590.4 | 1418.5 | 1356.4 |
| 40°    | 1866.6 | 1717.4 | 1475.7 | 1299.1 | 1234.4 |
| 42.5°  | 1772.1 | 1612.8 | 1361.4 | 1177.1 | 1115.1 |
| 45°    | 1672.5 | 1505.6 | 1244.5 | 1067.5 | 1007.9 |
| 47.5°  | 1578.0 | 1401.3 | 1132.5 | 955.6  | 901.0  |
| 50°    | 1473.4 | 1296.8 | 1022.9 | 851.0  | 799.0  |
| 52.5°  | 1371.2 | 1184.5 | 918.4  | 754.1  | 706.9  |
| 55°    | 1271.7 | 1077.6 | 808.8  | 659.6  | 612.3  |
| 57.5°  | 1169.8 | 970.6  | 711.9  | 572.5  | 532.5  |
| 60°    | 1065.2 | 866.1  | 609.7  | 483.0  | 443.0  |
| 62.5°  | 963.3  | 764.2  | 522.6  | 403.2  | 383.4  |
| 65°    | 858.7  | 657.0  | 433.1  | 348.6  | 340.9  |
| 67.5°  | 759.1  | 557.4  | 348.6  | 306.1  | 298.7  |
| 70°    | 654.5  | 460.5  | 288.6  | 263.8  | 253.7  |
| 72.5°  | 555.1  | 370.7  | 241.3  | 221.6  | 216.5  |
| 75°    | 457.9  | 283.6  | 199.1  | 181.7  | 179.3  |
| 77.5°  | 361.0  | 201.5  | 156.8  | 146.8  | 141.8  |
| 80°    | 271.2  | 144.4  | 119.3  | 109.6  | 109.6  |
| 82.5°  | 189.1  | 97.1   | 82.1   | 77.1   | 77.1   |
| 85°    | 106.9  | 54.7   | 47.2   | 47.2   | 47.2   |
| 87.5°  | 39.9   | 19.9   | 19.9   | 17.4   | 17.4   |
| 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   |

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**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 |

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**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 | 9.75             | 10.63 | 10.66 | 11.55 | 12.74 | 5.71           | 6.59 | 6.62  | 7.52  | 8.70  |
|                 | 3H   | 11.44            | 12.23 | 12.36 | 13.16 | 14.36 | 6.90           | 7.69 | 7.82  | 8.63  | 9.83  |
|                 | 4H   | 12.05            | 12.80 | 12.99 | 13.73 | 14.95 | 7.36           | 8.10 | 8.29  | 9.04  | 10.26 |
|                 | 6H   | 12.48            | 13.17 | 13.43 | 14.11 | 15.34 | 7.68           | 8.37 | 8.63  | 9.31  | 10.54 |
|                 | 8H   | 12.61            | 13.26 | 13.56 | 14.22 | 15.45 | 7.78           | 8.43 | 8.73  | 9.39  | 10.62 |
|                 | 12H  | 12.68            | 13.30 | 13.63 | 14.25 | 15.50 | 7.82           | 8.44 | 8.78  | 9.40  | 10.65 |
| 4H              | 2H   | 9.77             | 10.52 | 10.71 | 11.46 | 12.67 | 6.31           | 7.06 | 7.25  | 8.00  | 9.21  |
|                 | 3H   | 11.61            | 12.23 | 12.56 | 13.20 | 14.43 | 7.67           | 8.29 | 8.62  | 9.26  | 10.49 |
|                 | 4H   | 12.31            | 12.88 | 13.27 | 13.84 | 15.09 | 8.22           | 8.79 | 9.18  | 9.75  | 11.01 |
|                 | 6H   | 12.84            | 13.32 | 13.81 | 14.31 | 15.56 | 8.65           | 9.13 | 9.62  | 10.12 | 11.37 |
|                 | 8H   | 13.02            | 13.47 | 13.99 | 14.45 | 15.72 | 8.78           | 9.23 | 9.75  | 10.21 | 11.48 |
|                 | 12H  | 13.12            | 13.53 | 14.11 | 14.52 | 15.79 | 8.85           | 9.26 | 9.84  | 10.25 | 11.52 |
| 8H              | 4H   | 12.28            | 12.74 | 13.26 | 13.72 | 14.98 | 8.51           | 8.97 | 9.49  | 9.94  | 11.21 |
|                 | 6H   | 12.86            | 13.23 | 13.86 | 14.25 | 15.52 | 9.03           | 9.41 | 10.03 | 10.43 | 11.70 |
|                 | 8H   | 13.08            | 13.41 | 14.09 | 14.42 | 15.70 | 9.23           | 9.56 | 10.24 | 10.57 | 11.85 |
|                 | 12H  | 13.22            | 13.52 | 14.24 | 14.52 | 15.85 | 9.35           | 9.64 | 10.36 | 10.64 | 11.97 |
| 12H             | 4H   | 12.24            | 12.65 | 13.23 | 13.64 | 14.92 | 8.52           | 8.93 | 9.51  | 9.92  | 11.20 |
|                 | 6H   | 12.83            | 13.17 | 13.84 | 14.17 | 15.46 | 9.08           | 9.42 | 10.09 | 10.42 | 11.71 |
|                 | 8H   | 13.06            | 13.35 | 14.07 | 14.35 | 15.69 | 9.30           | 9.59 | 10.31 | 10.59 | 11.92 |