

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: P912876

Luminaire Tested: DFN2DIP-TR4F0-080D050US850-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P912876  
REPORT IS A COMBINATION OF REPORTS P900396 AND P897293  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-TR4F0-080D050US850-RLLFLL  
Description: 4 foot, Triangle Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

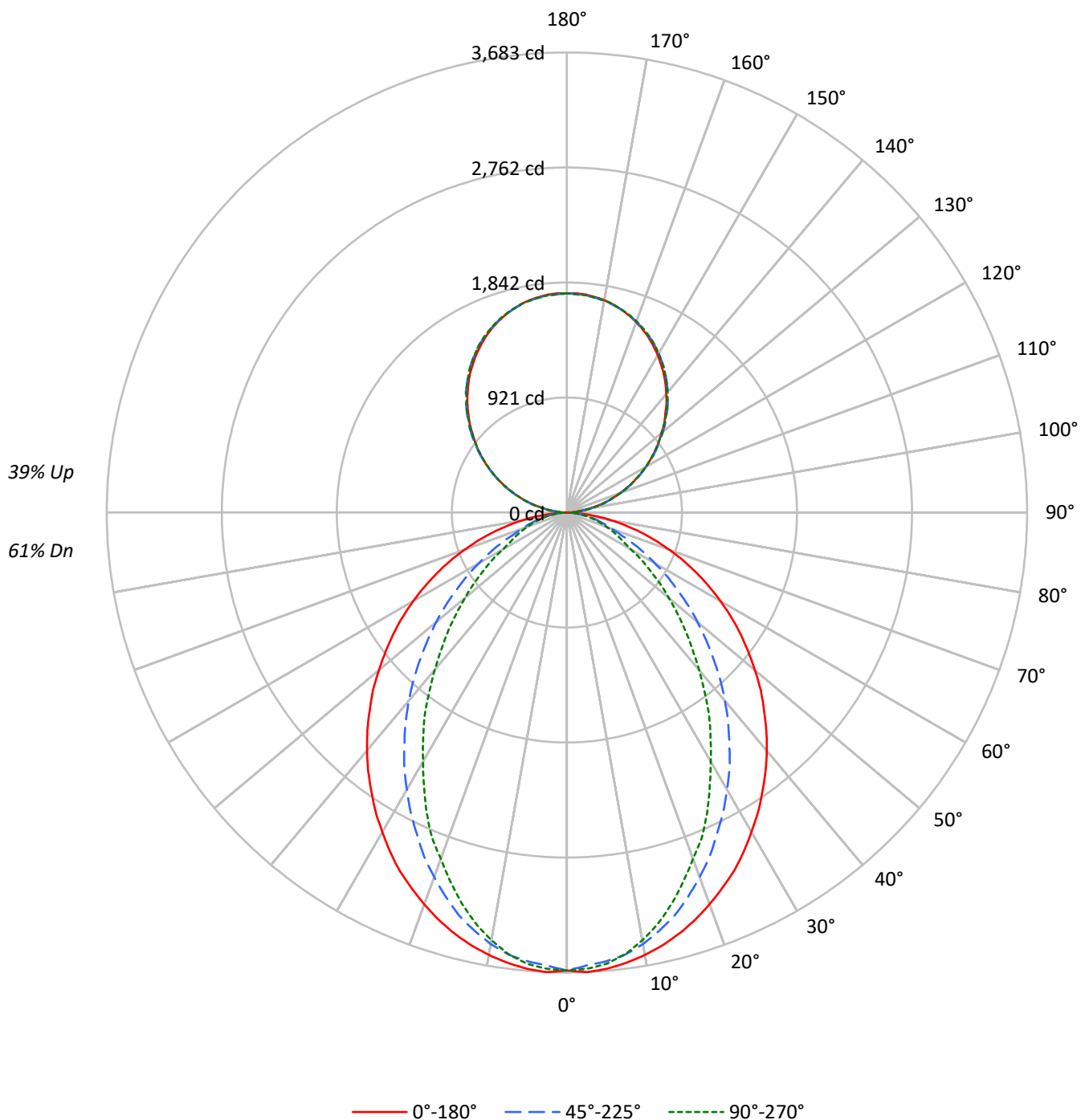
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 12448.6 lumens  
Efficiency: N/A  
Efficacy: 110.3 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.43' x L: 3.96' x H: 0.1')  
CIE Type: Semi-Direct  
  
Input Watts (W): 112.9  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9957  
Total Harmonic Distortion (THDi): 0.049  
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   | 110 | 110 | 110 | 110 | 103 | 103 | 103 | 103 | 89 | 89 | 89 | 77 | 77 | 77 | 66 | 66 | 66 |
| 1   | 101 | 97  | 93  | 89  | 94  | 91  | 87  | 84  | 79 | 77 | 75 | 69 | 67 | 65 | 59 | 58 | 57 |
| 2   | 92  | 85  | 79  | 74  | 86  | 80  | 75  | 70  | 70 | 66 | 63 | 61 | 58 | 56 | 53 | 51 | 49 |
| 3   | 85  | 75  | 68  | 62  | 79  | 71  | 64  | 59  | 62 | 57 | 53 | 55 | 51 | 48 | 47 | 45 | 42 |
| 4   | 78  | 67  | 59  | 53  | 72  | 63  | 56  | 51  | 56 | 50 | 46 | 49 | 45 | 41 | 43 | 39 | 37 |
| 5   | 72  | 60  | 52  | 46  | 67  | 57  | 50  | 44  | 50 | 45 | 40 | 44 | 40 | 36 | 39 | 35 | 32 |
| 6   | 66  | 54  | 46  | 41  | 62  | 51  | 44  | 39  | 46 | 40 | 35 | 40 | 36 | 32 | 35 | 32 | 29 |
| 7   | 61  | 49  | 41  | 36  | 57  | 47  | 39  | 34  | 42 | 36 | 32 | 37 | 32 | 29 | 32 | 29 | 26 |
| 8   | 57  | 45  | 37  | 32  | 53  | 43  | 36  | 31  | 38 | 32 | 28 | 34 | 29 | 26 | 30 | 26 | 23 |
| 9   | 53  | 41  | 34  | 29  | 50  | 39  | 32  | 28  | 35 | 29 | 26 | 31 | 27 | 23 | 28 | 24 | 21 |
| 10  | 50  | 38  | 31  | 26  | 47  | 36  | 29  | 25  | 32 | 27 | 23 | 29 | 25 | 21 | 26 | 22 | 20 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2913 | 2913 | 2913 |
| 5°  | 2918 | 2867 | 2885 |
| 10° | 2889 | 2811 | 2791 |
| 15° | 2849 | 2718 | 2646 |
| 20° | 2797 | 2590 | 2468 |
| 25° | 2743 | 2446 | 2296 |
| 30° | 2670 | 2299 | 2077 |
| 35° | 2599 | 2140 | 1886 |
| 40° | 2527 | 1977 | 1666 |
| 45° | 2444 | 1795 | 1467 |
| 50° | 2357 | 1612 | 1272 |
| 55° | 2267 | 1416 | 1086 |
| 60° | 2162 | 1211 | 894  |
| 65° | 2041 | 1002 | 804  |
| 70° | 1896 | 808  | 728  |
| 75° | 1712 | 713  | 662  |
| 80° | 1446 | 597  | 573  |
| 85° | 1008 | 399  | 431  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2444 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 343.7   | 2.8       |
| 10°-20°   | 943.4   | 7.6       |
| 20°-30°   | 1324.5  | 10.6      |
| 30°-40°   | 1443.8  | 11.6      |
| 40°-50°   | 1327.0  | 10.7      |
| 50°-60°   | 1042.1  | 8.4       |
| 60°-70°   | 678.3   | 5.4       |
| 70°-80°   | 349.2   | 2.8       |
| 80°-90°   | 94.1    | 0.8       |
| 90°-100°  | 108.5   | 0.9       |
| 100°-110° | 344.8   | 2.8       |
| 110°-120° | 590.1   | 4.7       |
| 120°-130° | 776.0   | 6.2       |
| 130°-140° | 871.0   | 7.0       |
| 140°-150° | 854.2   | 6.9       |
| 150°-160° | 716.5   | 5.8       |
| 160°-170° | 475.2   | 3.8       |
| 170°-180° | 166.1   | 1.3       |
| 0°-30°    | 2611.6  | 21.0      |
| 0°-40°    | 4055.4  | 32.6      |
| 0°-60°    | 6424.5  | 51.6      |
| 0°-90°    | 7546.2  | 60.6      |
| 90°-120°  | 1043.4  | 8.4       |
| 90°-150°  | 3544.6  | 28.5      |
| 90°-180°  | 4902.0  | 39.4      |
| 0°-180°   | 12448.6 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3667 | 3667  | 3667 | 3667  | 3667 |      |
| 5°   | 3667 | 3650  | 3607 | 3637  | 3627 | 348  |
| 15°  | 3488 | 3451  | 3338 | 3275  | 3242 | 983  |
| 25°  | 3166 | 3060  | 2840 | 2705  | 2655 | 1456 |
| 35°  | 2728 | 2558  | 2267 | 2058  | 1984 | 1707 |
| 45°  | 2230 | 2008  | 1659 | 1423  | 1344 | 1722 |
| 55°  | 1696 | 1437  | 1078 | 879   | 816  | 1515 |
| 65°  | 1145 | 876   | 577  | 465   | 454  | 1135 |
| 75°  | 610  | 378   | 266  | 242   | 239  | 646  |
| 85°  | 143  | 73    | 63   | 63    | 63   | 164  |
| 90°  | 2    | 19    | 52   | 49    | 50   | 12   |
| 95°  | 77   | 92    | 95   | 95    | 92   | 86   |
| 105° | 318  | 322   | 326  | 328   | 328  | 336  |
| 115° | 592  | 601   | 598  | 596   | 592  | 586  |
| 125° | 861  | 874   | 870  | 866   | 864  | 770  |
| 135° | 1114 | 1130  | 1134 | 1132  | 1128 | 861  |
| 145° | 1352 | 1363  | 1371 | 1373  | 1367 | 845  |
| 155° | 1546 | 1551  | 1555 | 1563  | 1558 | 712  |
| 165° | 1682 | 1681  | 1681 | 1691  | 1684 | 475  |
| 175° | 1751 | 1746  | 1743 | 1754  | 1745 | 166  |
| 180° | 1754 | 1754  | 1754 | 1754  | 1754 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3666.8 | 3666.8 | 3666.8 | 3666.8 | 3666.8 |
| 2.5°   | 3683.3 | 3666.8 | 3630.2 | 3663.6 | 3656.9 |
| 5°     | 3666.8 | 3650.3 | 3606.9 | 3636.9 | 3627.0 |
| 7.5°   | 3636.9 | 3617.1 | 3570.6 | 3583.7 | 3567.1 |
| 10°    | 3597.0 | 3573.9 | 3507.7 | 3497.5 | 3477.7 |
| 12.5°  | 3547.5 | 3517.5 | 3427.7 | 3408.0 | 3371.4 |
| 15°    | 3487.6 | 3451.0 | 3338.3 | 3275.3 | 3242.2 |
| 17.5°  | 3417.8 | 3364.7 | 3225.3 | 3152.4 | 3099.2 |
| 20°    | 3338.3 | 3271.8 | 3106.0 | 3023.2 | 2949.9 |
| 22.5°  | 3252.0 | 3175.6 | 2983.1 | 2870.4 | 2820.7 |
| 25°    | 3165.8 | 3059.5 | 2840.5 | 2704.6 | 2654.6 |
| 27.5°  | 3062.9 | 2949.9 | 2707.7 | 2551.8 | 2475.4 |
| 30°    | 2953.5 | 2827.1 | 2561.7 | 2392.7 | 2302.8 |
| 32.5°  | 2847.1 | 2694.4 | 2422.6 | 2223.3 | 2140.3 |
| 35°    | 2727.8 | 2558.5 | 2266.6 | 2057.5 | 1984.2 |
| 37.5°  | 2611.6 | 2428.9 | 2120.5 | 1891.3 | 1808.6 |
| 40°    | 2488.8 | 2289.9 | 1967.7 | 1732.1 | 1645.9 |
| 42.5°  | 2362.7 | 2150.5 | 1815.2 | 1569.6 | 1486.7 |
| 45°    | 2230.0 | 2007.5 | 1659.3 | 1423.4 | 1343.9 |
| 47.5°  | 2104.0 | 1868.4 | 1510.0 | 1274.1 | 1201.3 |
| 50°    | 1964.5 | 1729.0 | 1364.0 | 1134.7 | 1065.3 |
| 52.5°  | 1828.3 | 1579.3 | 1224.4 | 1005.5 | 942.5  |
| 55°    | 1695.6 | 1436.8 | 1078.4 | 879.4  | 816.4  |
| 57.5°  | 1559.7 | 1294.2 | 949.2  | 763.3  | 710.1  |
| 60°    | 1420.2 | 1154.8 | 812.9  | 643.9  | 590.8  |
| 62.5°  | 1284.3 | 1018.8 | 696.8  | 537.6  | 511.2  |
| 65°    | 1144.9 | 875.9  | 577.3  | 464.8  | 454.5  |
| 67.5°  | 1012.2 | 743.3  | 464.8  | 408.0  | 398.2  |
| 70°    | 872.8  | 614.1  | 384.8  | 351.7  | 338.4  |
| 72.5°  | 740.0  | 494.3  | 321.8  | 295.4  | 288.7  |
| 75°    | 610.5  | 378.2  | 265.5  | 242.2  | 239.1  |
| 77.5°  | 481.3  | 268.6  | 209.2  | 195.7  | 189.1  |
| 80°    | 361.5  | 192.6  | 159.1  | 146.1  | 146.1  |
| 82.5°  | 252.1  | 129.5  | 109.5  | 102.8  | 102.8  |
| 85°    | 142.6  | 72.9   | 63.0   | 63.0   | 63.0   |
| 87.5°  | 53.1   | 26.4   | 26.4   | 23.3   | 23.3   |
| 90°    | 1.6    | 19.1   | 51.8   | 48.7   | 50.2   |
| 92.5°  | 32.8   | 44.4   | 46.0   | 47.6   | 47.6   |
| 95°    | 77.2   | 92.0   | 94.6   | 94.6   | 92.0   |
| 97.5°  | 128.4  | 142.2  | 148.1  | 148.1  | 148.1  |
| 100°   | 187.6  | 199.8  | 204.1  | 204.1  | 202.5  |
| 102.5° | 250.1  | 259.1  | 264.8  | 266.5  | 264.8  |
| 105°   | 318.3  | 322.5  | 325.7  | 328.3  | 328.3  |
| 107.5° | 385.9  | 392.3  | 392.3  | 393.4  | 385.9  |
| 110°   | 451.5  | 460.0  | 460.0  | 460.0  | 455.7  |



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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 522.3  | 531.3  | 529.8  | 525.6  | 522.3  |
| 115°   | 592.1  | 600.6  | 598.0  | 596.4  | 592.1  |
| 117.5° | 661.4  | 673.1  | 665.6  | 661.4  | 657.2  |
| 120°   | 731.2  | 742.8  | 731.2  | 731.2  | 726.4  |
| 122.5° | 794.6  | 809.5  | 802.0  | 797.8  | 794.6  |
| 125°   | 861.2  | 874.4  | 870.2  | 865.5  | 863.9  |
| 127.5° | 926.2  | 942.6  | 936.9  | 930.5  | 926.2  |
| 130°   | 987.1  | 1006.1 | 1003.4 | 1000.3 | 994.4  |
| 132.5° | 1055.3 | 1070.1 | 1071.2 | 1063.8 | 1059.5 |
| 135°   | 1114.0 | 1130.3 | 1133.5 | 1132.0 | 1127.7 |
| 137.5° | 1179.5 | 1192.7 | 1195.4 | 1194.3 | 1188.0 |
| 140°   | 1237.1 | 1250.4 | 1257.7 | 1257.7 | 1252.0 |
| 142.5° | 1296.3 | 1309.6 | 1313.8 | 1315.4 | 1309.6 |
| 145°   | 1352.4 | 1363.0 | 1371.4 | 1373.1 | 1367.2 |
| 147.5° | 1402.7 | 1415.9 | 1422.2 | 1424.8 | 1419.0 |
| 150°   | 1454.5 | 1463.4 | 1469.2 | 1474.0 | 1469.2 |
| 152.5° | 1500.5 | 1509.5 | 1516.8 | 1522.7 | 1516.8 |
| 155°   | 1546.4 | 1550.6 | 1555.4 | 1562.8 | 1558.0 |
| 157.5° | 1586.1 | 1589.2 | 1591.9 | 1602.5 | 1595.1 |
| 160°   | 1621.5 | 1624.7 | 1626.2 | 1635.2 | 1628.9 |
| 162.5° | 1654.3 | 1654.3 | 1655.8 | 1665.9 | 1658.5 |
| 165°   | 1682.4 | 1680.7 | 1680.7 | 1691.3 | 1683.9 |
| 167.5° | 1707.6 | 1702.9 | 1702.9 | 1713.5 | 1706.1 |
| 170°   | 1726.7 | 1722.5 | 1720.9 | 1731.5 | 1722.5 |
| 172.5° | 1739.9 | 1735.7 | 1734.1 | 1744.7 | 1735.7 |
| 175°   | 1750.6 | 1746.2 | 1743.1 | 1753.7 | 1744.7 |
| 177.5° | 1756.3 | 1752.1 | 1748.9 | 1757.9 | 1748.9 |
| 180°   | 1753.7 | 1753.7 | 1753.7 | 1753.7 | 1753.7 |

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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 | 11.79            | 12.72 | 12.66 | 13.60 | 14.72 | 7.77           | 8.69  | 8.63  | 9.58  | 10.69 |
|                 | 3H   | 13.48            | 14.31 | 14.36 | 15.20 | 16.34 | 8.96           | 9.79  | 9.84  | 10.68 | 11.82 |
|                 | 4H   | 14.09            | 14.87 | 14.99 | 15.77 | 16.92 | 9.42           | 10.20 | 10.32 | 11.10 | 12.25 |
|                 | 6H   | 14.52            | 15.24 | 15.42 | 16.14 | 17.30 | 9.75           | 10.46 | 10.65 | 11.37 | 12.53 |
|                 | 8H   | 14.65            | 15.33 | 15.56 | 16.25 | 17.41 | 9.84           | 10.52 | 10.75 | 11.45 | 12.61 |
|                 | 12H  | 14.71            | 15.36 | 15.63 | 16.28 | 17.47 | 9.89           | 10.54 | 10.81 | 11.45 | 12.64 |
| 4H              | 2H   | 11.82            | 12.60 | 12.72 | 13.50 | 14.65 | 8.37           | 9.15  | 9.27  | 10.05 | 11.20 |
|                 | 3H   | 13.66            | 14.31 | 14.57 | 15.24 | 16.41 | 9.73           | 10.38 | 10.64 | 11.31 | 12.48 |
|                 | 4H   | 14.36            | 14.95 | 15.28 | 15.87 | 17.06 | 10.29          | 10.88 | 11.21 | 11.80 | 12.99 |
|                 | 6H   | 14.88            | 15.39 | 15.81 | 16.34 | 17.53 | 10.71          | 11.22 | 11.65 | 12.17 | 13.36 |
|                 | 8H   | 15.05            | 15.53 | 15.99 | 16.47 | 17.68 | 10.84          | 11.32 | 11.78 | 12.26 | 13.47 |
|                 | 12H  | 15.15            | 15.58 | 16.11 | 16.54 | 17.75 | 10.91          | 11.34 | 11.87 | 12.30 | 13.51 |
| 8H              | 4H   | 14.33            | 14.81 | 15.27 | 15.75 | 16.96 | 10.57          | 11.05 | 11.51 | 11.99 | 13.20 |
|                 | 6H   | 14.90            | 15.29 | 15.87 | 16.28 | 17.48 | 11.10          | 11.49 | 12.06 | 12.47 | 13.68 |
|                 | 8H   | 15.12            | 15.46 | 16.09 | 16.44 | 17.66 | 11.29          | 11.63 | 12.26 | 12.61 | 13.83 |
|                 | 12H  | 15.26            | 15.57 | 16.24 | 16.53 | 17.81 | 11.41          | 11.72 | 12.39 | 12.69 | 13.96 |
| 12H             | 4H   | 14.29            | 14.72 | 15.24 | 15.68 | 16.89 | 10.58          | 11.01 | 11.54 | 11.97 | 13.18 |
|                 | 6H   | 14.88            | 15.22 | 15.85 | 16.20 | 17.42 | 11.14          | 11.49 | 12.12 | 12.47 | 13.69 |
|                 | 8H   | 15.10            | 15.41 | 16.08 | 16.38 | 17.65 | 11.36          | 11.67 | 12.34 | 12.63 | 13.91 |