

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: P912195

Luminaire Tested: DFN2DIP-SQ4F0-080D060US850-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P912195  
REPORT IS A COMBINATION OF REPORTS P901584 AND P898471  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ4F0-080D060US850-RLLONL  
Description: 4 foot, Square Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

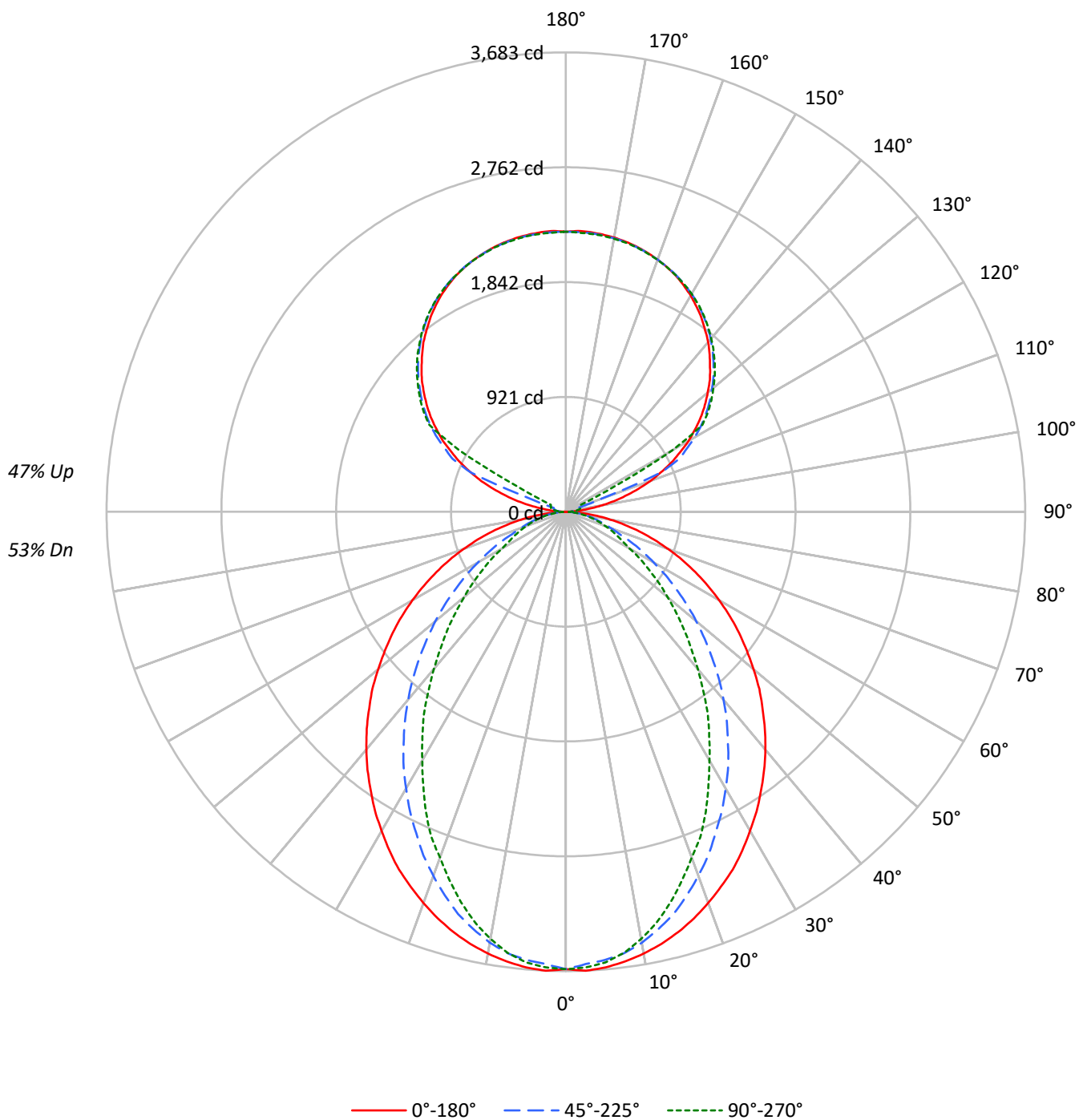
Lumens per Lamp: N/A  
Luminaire Lumens: 14128.7 lumens  
Efficiency: N/A  
Efficacy: 121.2 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.92' x L: 3.92' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 116.6  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9954  
Total Harmonic Distortion (THDi): 0.076  
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   | 108 | 108 | 108 | 108 | 100 | 100 | 100 | 100 | 85 | 85 | 85 | 72 | 72 | 72 | 59 | 59 | 59 |
| 1   | 99  | 95  | 91  | 88  | 92  | 88  | 85  | 82  | 76 | 73 | 71 | 64 | 62 | 61 | 53 | 52 | 51 |
| 2   | 91  | 83  | 78  | 73  | 84  | 78  | 73  | 68  | 67 | 63 | 60 | 57 | 54 | 52 | 47 | 45 | 44 |
| 3   | 83  | 74  | 67  | 61  | 77  | 69  | 63  | 58  | 59 | 55 | 51 | 51 | 47 | 44 | 42 | 40 | 38 |
| 4   | 76  | 66  | 58  | 52  | 70  | 61  | 55  | 49  | 53 | 48 | 44 | 45 | 42 | 38 | 38 | 35 | 33 |
| 5   | 70  | 59  | 51  | 45  | 65  | 55  | 48  | 43  | 48 | 42 | 38 | 41 | 37 | 34 | 35 | 32 | 29 |
| 6   | 65  | 53  | 45  | 39  | 60  | 50  | 43  | 37  | 43 | 38 | 34 | 37 | 33 | 30 | 32 | 28 | 26 |
| 7   | 60  | 48  | 40  | 35  | 56  | 45  | 38  | 33  | 39 | 34 | 30 | 34 | 30 | 26 | 29 | 26 | 23 |
| 8   | 56  | 44  | 36  | 31  | 52  | 41  | 34  | 29  | 36 | 31 | 27 | 31 | 27 | 24 | 27 | 24 | 21 |
| 9   | 52  | 40  | 33  | 28  | 48  | 38  | 31  | 26  | 33 | 28 | 24 | 29 | 25 | 22 | 25 | 22 | 19 |
| 10  | 49  | 37  | 30  | 25  | 45  | 35  | 28  | 24  | 31 | 25 | 22 | 27 | 23 | 20 | 23 | 20 | 17 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2573 | 2573 | 2573 |
| 5°  | 2577 | 2533 | 2549 |
| 10° | 2551 | 2483 | 2467 |
| 15° | 2516 | 2402 | 2339 |
| 20° | 2470 | 2289 | 2182 |
| 25° | 2422 | 2163 | 2031 |
| 30° | 2358 | 2033 | 1839 |
| 35° | 2296 | 1894 | 1670 |
| 40° | 2232 | 1749 | 1476 |
| 45° | 2158 | 1589 | 1300 |
| 50° | 2081 | 1428 | 1129 |
| 55° | 2001 | 1255 | 964  |
| 60° | 1909 | 1074 | 794  |
| 65° | 1802 | 890  | 715  |
| 70° | 1673 | 718  | 649  |
| 75° | 1511 | 634  | 592  |
| 80° | 1276 | 534  | 516  |
| 85° | 889  | 359  | 393  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2158 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 343.7   | 2.4       |
| 10°-20°   | 943.4   | 6.7       |
| 20°-30°   | 1324.5  | 9.4       |
| 30°-40°   | 1443.8  | 10.2      |
| 40°-50°   | 1327.0  | 9.4       |
| 50°-60°   | 1042.1  | 7.4       |
| 60°-70°   | 678.3   | 4.8       |
| 70°-80°   | 349.2   | 2.5       |
| 80°-90°   | 93.1    | 0.7       |
| 90°-100°  | 74.1    | 0.5       |
| 100°-110° | 276.0   | 2.0       |
| 110°-120° | 732.1   | 5.2       |
| 120°-130° | 1214.2  | 8.6       |
| 130°-140° | 1289.8  | 9.1       |
| 140°-150° | 1198.7  | 8.5       |
| 150°-160° | 963.8   | 6.8       |
| 160°-170° | 621.0   | 4.4       |
| 170°-180° | 213.7   | 1.5       |
| 0°-30°    | 2611.6  | 18.5      |
| 0°-40°    | 4055.4  | 28.7      |
| 0°-60°    | 6424.5  | 45.5      |
| 0°-90°    | 7545.2  | 53.4      |
| 90°-120°  | 1082.2  | 7.7       |
| 90°-150°  | 4785.0  | 33.9      |
| 90°-180°  | 6583.0  | 46.6      |
| 0°-180°   | 14128.7 | 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    | 20    | 32   | 41    | 44   | 13   |
| 95°  | 106  | 52    | 63   | 72    | 70   | 125  |
| 105° | 494  | 543   | 99   | 117   | 124  | 528  |
| 115° | 934  | 962   | 1003 | 250   | 133  | 920  |
| 125° | 1321 | 1342  | 1373 | 1384  | 1389 | 1178 |
| 135° | 1635 | 1661  | 1675 | 1692  | 1688 | 1263 |
| 145° | 1896 | 1895  | 1922 | 1934  | 1926 | 1186 |
| 155° | 2088 | 2074  | 2093 | 2103  | 2090 | 962  |
| 165° | 2200 | 2190  | 2195 | 2207  | 2195 | 622  |
| 175° | 2250 | 2239  | 2242 | 2254  | 2238 | 214  |
| 180° | 2246 | 2246  | 2246 | 2246  | 2246 |      |

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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    | 19.5   | 32.4   | 40.7   | 43.8   |
| 92.5°  | 40.7   | 34.2   | 38.9   | 42.3   | 43.8   |
| 95°    | 105.6  | 51.9   | 63.3   | 71.6   | 69.9   |
| 97.5°  | 190.1  | 56.9   | 82.7   | 87.8   | 89.4   |
| 100°   | 287.7  | 65.0   | 92.6   | 105.6  | 108.8  |
| 102.5° | 394.8  | 391.7  | 95.9   | 113.7  | 118.7  |
| 105°   | 493.9  | 542.7  | 99.1   | 116.9  | 123.5  |
| 107.5° | 609.4  | 649.9  | 102.5  | 120.2  | 126.8  |
| 110°   | 720.0  | 753.9  | 284.5  | 122.0  | 128.3  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 823.9  | 853.0  | 825.4  | 125.0  | 130.1  |
| 115°   | 934.3  | 961.9  | 1002.6 | 250.3  | 133.3  |
| 117.5° | 1030.2 | 1062.6 | 1090.4 | 857.9  | 432.2  |
| 120°   | 1137.5 | 1161.8 | 1191.2 | 1210.6 | 991.2  |
| 122.5° | 1228.3 | 1254.4 | 1287.0 | 1296.6 | 1298.4 |
| 125°   | 1321.0 | 1342.2 | 1373.1 | 1384.5 | 1389.2 |
| 127.5° | 1405.5 | 1428.3 | 1452.8 | 1469.0 | 1470.5 |
| 130°   | 1485.2 | 1511.2 | 1529.0 | 1546.9 | 1545.4 |
| 132.5° | 1566.5 | 1587.6 | 1605.4 | 1620.0 | 1618.5 |
| 135°   | 1634.8 | 1660.8 | 1675.3 | 1691.7 | 1688.3 |
| 137.5° | 1706.1 | 1725.6 | 1742.0 | 1758.2 | 1753.4 |
| 140°   | 1776.0 | 1789.1 | 1806.9 | 1821.5 | 1813.4 |
| 142.5° | 1834.6 | 1846.0 | 1867.1 | 1880.0 | 1871.9 |
| 145°   | 1896.4 | 1894.6 | 1922.2 | 1933.7 | 1925.6 |
| 147.5° | 1949.8 | 1945.0 | 1972.6 | 1980.7 | 1974.4 |
| 150°   | 2002.0 | 1990.5 | 2016.6 | 2026.3 | 2018.2 |
| 152.5° | 2045.8 | 2032.8 | 2057.1 | 2067.0 | 2055.5 |
| 155°   | 2088.0 | 2073.5 | 2093.0 | 2102.7 | 2089.7 |
| 157.5° | 2122.2 | 2109.2 | 2123.8 | 2135.3 | 2122.2 |
| 160°   | 2151.5 | 2141.6 | 2151.5 | 2161.1 | 2149.8 |
| 162.5° | 2177.3 | 2167.7 | 2175.7 | 2187.2 | 2172.5 |
| 165°   | 2200.1 | 2190.5 | 2195.3 | 2206.7 | 2195.3 |
| 167.5° | 2218.0 | 2208.2 | 2213.2 | 2224.7 | 2209.9 |
| 170°   | 2232.7 | 2222.9 | 2226.2 | 2237.5 | 2222.9 |
| 172.5° | 2242.4 | 2232.7 | 2236.0 | 2247.4 | 2232.7 |
| 175°   | 2250.5 | 2239.1 | 2242.4 | 2253.7 | 2237.5 |
| 177.5° | 2253.7 | 2242.4 | 2244.1 | 2255.5 | 2240.8 |
| 180°   | 2245.6 | 2245.6 | 2245.6 | 2245.6 | 2245.6 |

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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 | 10.76            | 11.61 | 11.69 | 12.56 | 13.79 | 6.72           | 7.58  | 7.65  | 8.52  | 9.75  |
|                 | 3H   | 12.44            | 13.21 | 13.39 | 14.16 | 15.41 | 7.91           | 8.68  | 8.85  | 9.63  | 10.88 |
|                 | 4H   | 13.05            | 13.78 | 14.01 | 14.74 | 16.00 | 8.36           | 9.09  | 9.32  | 10.05 | 11.30 |
|                 | 6H   | 13.48            | 14.15 | 14.45 | 15.11 | 16.38 | 8.68           | 9.35  | 9.65  | 10.32 | 11.59 |
|                 | 8H   | 13.61            | 14.24 | 14.59 | 15.23 | 16.49 | 8.77           | 9.41  | 9.75  | 10.39 | 11.66 |
|                 | 12H  | 13.67            | 14.28 | 14.66 | 15.25 | 16.55 | 8.82           | 9.42  | 9.80  | 10.40 | 11.69 |
| 4H              | 2H   | 10.78            | 11.50 | 11.74 | 12.46 | 13.72 | 7.32           | 8.04  | 8.28  | 9.00  | 10.26 |
|                 | 3H   | 12.61            | 13.22 | 13.59 | 14.21 | 15.48 | 8.67           | 9.27  | 9.65  | 10.26 | 11.54 |
|                 | 4H   | 13.31            | 13.86 | 14.30 | 14.85 | 16.14 | 9.22           | 9.77  | 10.21 | 10.76 | 12.05 |
|                 | 6H   | 13.83            | 14.30 | 14.83 | 15.31 | 16.61 | 9.64           | 10.12 | 10.64 | 11.12 | 12.42 |
|                 | 8H   | 14.01            | 14.45 | 15.01 | 15.45 | 16.76 | 9.77           | 10.21 | 10.77 | 11.22 | 12.52 |
|                 | 12H  | 14.11            | 14.51 | 15.12 | 15.52 | 16.84 | 9.84           | 10.24 | 10.86 | 11.25 | 12.57 |
| 8H              | 4H   | 13.28            | 13.72 | 14.28 | 14.72 | 16.03 | 9.51           | 9.95  | 10.50 | 10.95 | 12.26 |
|                 | 6H   | 13.85            | 14.22 | 14.87 | 15.26 | 16.57 | 10.03          | 10.39 | 11.05 | 11.43 | 12.74 |
|                 | 8H   | 14.07            | 14.39 | 15.10 | 15.42 | 16.75 | 10.22          | 10.54 | 11.25 | 11.57 | 12.89 |
|                 | 12H  | 14.22            | 14.50 | 15.25 | 15.52 | 16.89 | 10.34          | 10.62 | 11.37 | 11.65 | 13.02 |
| 12H             | 4H   | 13.23            | 13.63 | 14.25 | 14.65 | 15.96 | 9.51           | 9.91  | 10.53 | 10.93 | 12.24 |
|                 | 6H   | 13.83            | 14.15 | 14.86 | 15.18 | 16.50 | 10.08          | 10.40 | 11.11 | 11.43 | 12.75 |
|                 | 8H   | 14.05            | 14.34 | 15.09 | 15.36 | 16.73 | 10.29          | 10.57 | 11.32 | 11.60 | 12.97 |