

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: P924579

Luminaire Tested: DFN2DIP-HX4F0-070D110US950-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P924579  
REPORT IS A COMBINATION OF REPORTS P899432 AND P896188  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX4F0-070D110US950-RLLFLL  
Description: 4 foot, Hexagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

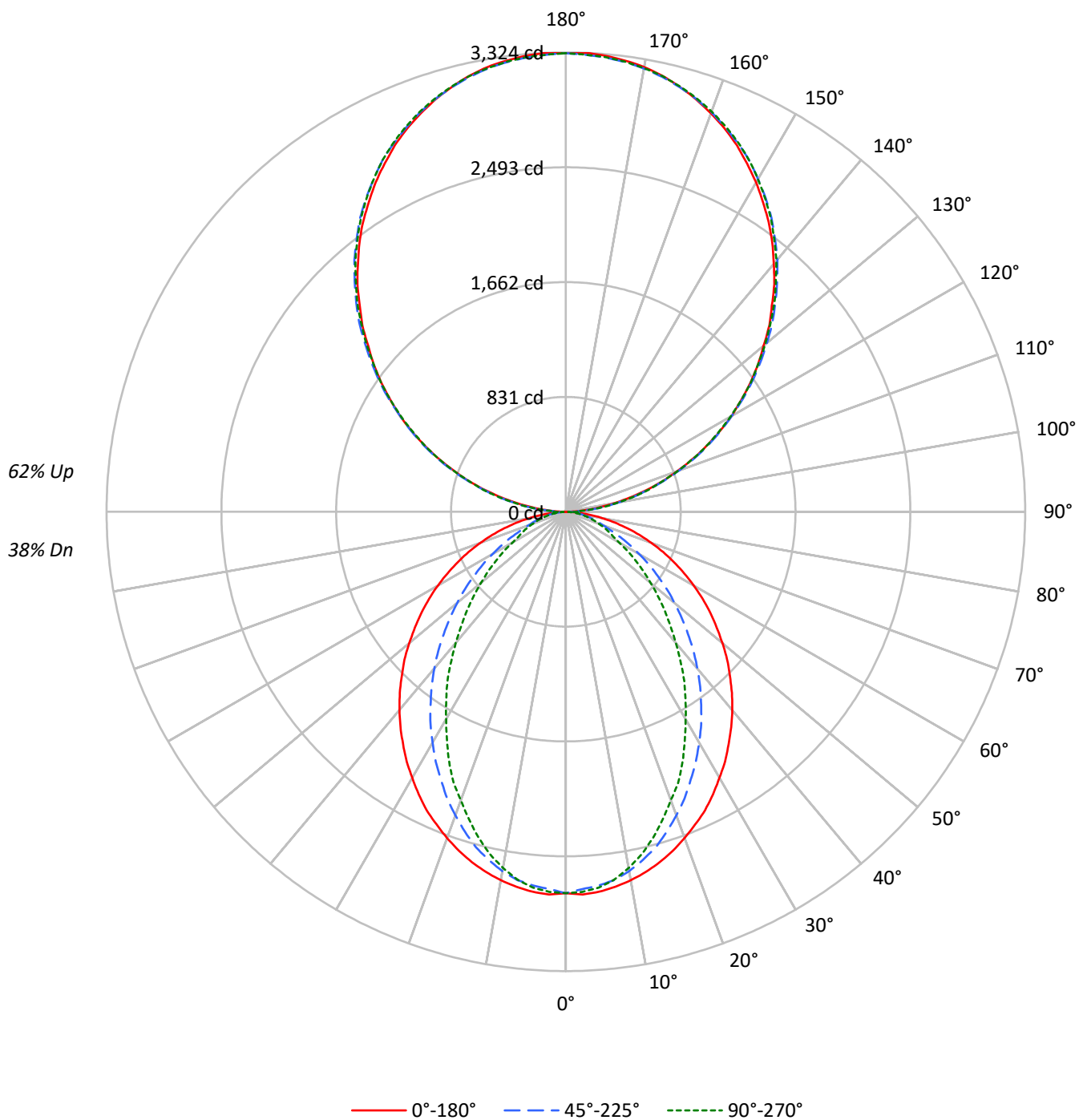
Lumens per Lamp: N/A  
Luminaire Lumens: 14963.5 lumens  
Efficiency: N/A  
Efficacy: 113.8 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.54' x L: 4.09' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 131.5  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9972  
Total Harmonic Distortion (THDi): 0.128  
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



TEST NUMBER: P924579

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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   | 104 | 104 | 104 | 104 | 95 | 95 | 95 | 95 | 77 | 77 | 77 | 60 | 60 | 60 | 45 | 45 | 45 |
| 1   | 95  | 91  | 88  | 84  | 87 | 83 | 80 | 77 | 68 | 66 | 64 | 53 | 52 | 51 | 40 | 40 | 39 |
| 2   | 87  | 80  | 74  | 69  | 79 | 73 | 68 | 64 | 60 | 56 | 53 | 47 | 45 | 43 | 36 | 34 | 33 |
| 3   | 80  | 71  | 64  | 58  | 72 | 65 | 59 | 54 | 53 | 49 | 45 | 42 | 39 | 37 | 32 | 30 | 29 |
| 4   | 73  | 63  | 55  | 49  | 66 | 57 | 51 | 46 | 47 | 42 | 39 | 38 | 34 | 32 | 29 | 27 | 25 |
| 5   | 67  | 56  | 48  | 43  | 61 | 51 | 45 | 40 | 42 | 37 | 34 | 34 | 30 | 28 | 26 | 24 | 22 |
| 6   | 62  | 50  | 43  | 37  | 56 | 46 | 39 | 34 | 38 | 33 | 29 | 31 | 27 | 24 | 24 | 21 | 20 |
| 7   | 57  | 45  | 38  | 32  | 52 | 42 | 35 | 30 | 35 | 30 | 26 | 28 | 24 | 22 | 22 | 19 | 17 |
| 8   | 53  | 41  | 34  | 29  | 48 | 38 | 31 | 27 | 32 | 27 | 23 | 26 | 22 | 19 | 20 | 18 | 16 |
| 9   | 49  | 38  | 30  | 26  | 45 | 35 | 28 | 24 | 29 | 24 | 21 | 24 | 20 | 17 | 19 | 16 | 14 |
| 10  | 46  | 35  | 28  | 23  | 42 | 32 | 26 | 22 | 27 | 22 | 19 | 22 | 18 | 16 | 17 | 15 | 13 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2052 | 2052 | 2052 |
| 5°  | 2056 | 2020 | 2033 |
| 10° | 2035 | 1980 | 1967 |
| 15° | 2008 | 1915 | 1864 |
| 20° | 1971 | 1825 | 1739 |
| 25° | 1933 | 1724 | 1618 |
| 30° | 1882 | 1621 | 1464 |
| 35° | 1832 | 1509 | 1329 |
| 40° | 1782 | 1394 | 1175 |
| 45° | 1723 | 1266 | 1034 |
| 50° | 1662 | 1137 | 897  |
| 55° | 1599 | 999  | 766  |
| 60° | 1525 | 855  | 630  |
| 65° | 1441 | 708  | 568  |
| 70° | 1338 | 571  | 514  |
| 75° | 1210 | 504  | 468  |
| 80° | 1024 | 423  | 406  |
| 85° | 715  | 284  | 306  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 2501 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 258.7   | 1.7       |
| 10°-20°   | 710.1   | 4.7       |
| 20°-30°   | 997.0   | 6.7       |
| 30°-40°   | 1086.8  | 7.3       |
| 40°-50°   | 998.8   | 6.7       |
| 50°-60°   | 784.4   | 5.2       |
| 60°-70°   | 510.6   | 3.4       |
| 70°-80°   | 262.8   | 1.8       |
| 80°-90°   | 76.5    | 0.5       |
| 90°-100°  | 205.4   | 1.4       |
| 100°-110° | 652.5   | 4.4       |
| 110°-120° | 1116.7  | 7.5       |
| 120°-130° | 1468.6  | 9.8       |
| 130°-140° | 1648.4  | 11.0      |
| 140°-150° | 1616.5  | 10.8      |
| 150°-160° | 1356.0  | 9.1       |
| 160°-170° | 899.3   | 6.0       |
| 170°-180° | 314.3   | 2.1       |
| 0°-30°    | 1965.7  | 13.1      |
| 0°-40°    | 3052.5  | 20.4      |
| 0°-60°    | 4835.8  | 32.3      |
| 0°-90°    | 5685.7  | 38.0      |
| 90°-120°  | 1974.6  | 13.2      |
| 90°-150°  | 6708.2  | 44.8      |
| 90°-180°  | 9278.0  | 62.0      |
| 0°-180°   | 14963.5 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2760 | 2760  | 2760 | 2760  | 2760 |      |
| 5°   | 2760 | 2748  | 2715 | 2738  | 2730 | 262  |
| 15°  | 2625 | 2598  | 2513 | 2465  | 2440 | 740  |
| 25°  | 2383 | 2303  | 2138 | 2036  | 1998 | 1096 |
| 35°  | 2053 | 1926  | 1706 | 1549  | 1494 | 1285 |
| 45°  | 1679 | 1511  | 1249 | 1071  | 1012 | 1296 |
| 55°  | 1276 | 1082  | 812  | 662   | 615  | 1140 |
| 65°  | 862  | 659   | 435  | 350   | 342  | 854  |
| 75°  | 460  | 285   | 200  | 182   | 180  | 486  |
| 85°  | 107  | 55    | 47   | 47    | 47   | 123  |
| 90°  | 3    | 36    | 98   | 92    | 95   | 15   |
| 95°  | 146  | 174   | 179  | 179   | 174  | 163  |
| 105° | 602  | 610   | 616  | 621   | 621  | 636  |
| 115° | 1121 | 1137  | 1132 | 1129  | 1121 | 1108 |
| 125° | 1630 | 1655  | 1647 | 1638  | 1635 | 1457 |
| 135° | 2108 | 2139  | 2145 | 2142  | 2134 | 1630 |
| 145° | 2559 | 2579  | 2596 | 2598  | 2587 | 1599 |
| 155° | 2927 | 2935  | 2944 | 2958  | 2949 | 1347 |
| 165° | 3184 | 3181  | 3181 | 3201  | 3187 | 898  |
| 175° | 3313 | 3305  | 3299 | 3319  | 3302 | 315  |
| 180° | 3319 | 3319  | 3319 | 3319  | 3319 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2760.0 | 2760.0 | 2760.0 | 2760.0 | 2760.0 |
| 2.5°   | 2772.4 | 2760.0 | 2732.4 | 2757.6 | 2752.6 |
| 5°     | 2760.0 | 2747.5 | 2715.0 | 2737.5 | 2730.1 |
| 7.5°   | 2737.5 | 2722.6 | 2687.7 | 2697.4 | 2685.0 |
| 10°    | 2707.5 | 2690.1 | 2640.2 | 2632.6 | 2617.7 |
| 12.5°  | 2670.2 | 2647.6 | 2580.1 | 2565.2 | 2537.6 |
| 15°    | 2625.1 | 2597.6 | 2512.7 | 2465.3 | 2440.4 |
| 17.5°  | 2572.7 | 2532.7 | 2427.7 | 2372.8 | 2332.8 |
| 20°    | 2512.7 | 2462.7 | 2337.9 | 2275.6 | 2220.4 |
| 22.5°  | 2447.9 | 2390.3 | 2245.3 | 2160.5 | 2123.2 |
| 25°    | 2382.9 | 2302.9 | 2138.0 | 2035.7 | 1998.2 |
| 27.5°  | 2305.5 | 2220.4 | 2038.1 | 1920.8 | 1863.3 |
| 30°    | 2223.1 | 2128.0 | 1928.1 | 1801.0 | 1733.4 |
| 32.5°  | 2143.1 | 2028.1 | 1823.5 | 1673.5 | 1610.9 |
| 35°    | 2053.2 | 1925.7 | 1706.1 | 1548.7 | 1493.6 |
| 37.5°  | 1965.8 | 1828.2 | 1596.1 | 1423.6 | 1361.4 |
| 40°    | 1873.3 | 1723.6 | 1481.1 | 1303.8 | 1238.9 |
| 42.5°  | 1778.4 | 1618.7 | 1366.3 | 1181.3 | 1119.1 |
| 45°    | 1678.6 | 1511.0 | 1249.0 | 1071.4 | 1011.5 |
| 47.5°  | 1583.6 | 1406.4 | 1136.6 | 959.1  | 904.2  |
| 50°    | 1478.7 | 1301.4 | 1026.6 | 854.1  | 801.9  |
| 52.5°  | 1376.1 | 1188.8 | 921.7  | 756.8  | 709.4  |
| 55°    | 1276.3 | 1081.5 | 811.7  | 662.0  | 614.6  |
| 57.5°  | 1174.0 | 974.1  | 714.5  | 574.5  | 534.5  |
| 60°    | 1069.1 | 869.2  | 611.9  | 484.7  | 444.7  |
| 62.5°  | 966.7  | 766.9  | 524.4  | 404.7  | 384.7  |
| 65°    | 861.7  | 659.3  | 434.6  | 349.8  | 342.1  |
| 67.5°  | 761.9  | 559.4  | 349.8  | 307.1  | 299.7  |
| 70°    | 656.9  | 462.1  | 289.6  | 264.7  | 254.6  |
| 72.5°  | 557.0  | 372.1  | 242.2  | 222.4  | 217.3  |
| 75°    | 459.5  | 284.6  | 199.8  | 182.3  | 179.9  |
| 77.5°  | 362.2  | 202.2  | 157.4  | 147.3  | 142.3  |
| 80°    | 272.2  | 144.9  | 119.8  | 110.0  | 110.0  |
| 82.5°  | 189.8  | 97.5   | 82.4   | 77.4   | 77.4   |
| 85°    | 107.3  | 54.9   | 47.4   | 47.4   | 47.4   |
| 87.5°  | 40.0   | 19.8   | 19.8   | 17.5   | 17.5   |
| 90°    | 3.0    | 36.1   | 98.1   | 92.1   | 95.0   |
| 92.5°  | 62.0   | 84.0   | 87.0   | 90.1   | 90.1   |
| 95°    | 146.1  | 174.1  | 179.1  | 179.1  | 174.1  |
| 97.5°  | 243.2  | 269.1  | 280.2  | 280.2  | 280.2  |
| 100°   | 355.2  | 378.2  | 386.2  | 386.2  | 383.2  |
| 102.5° | 473.3  | 490.3  | 501.3  | 504.3  | 501.3  |
| 105°   | 602.4  | 610.4  | 616.4  | 621.3  | 621.3  |
| 107.5° | 730.4  | 742.4  | 742.4  | 744.4  | 730.4  |
| 110°   | 854.5  | 870.5  | 870.5  | 870.5  | 862.5  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 988.5  | 1005.5 | 1002.6 | 994.5  | 988.5  |
| 115°   | 1120.7 | 1136.6 | 1131.6 | 1128.7 | 1120.7 |
| 117.5° | 1251.7 | 1273.7 | 1259.7 | 1251.7 | 1243.7 |
| 120°   | 1383.8 | 1405.8 | 1383.8 | 1383.8 | 1374.8 |
| 122.5° | 1503.9 | 1531.8 | 1517.8 | 1509.8 | 1503.9 |
| 125°   | 1629.9 | 1654.9 | 1646.9 | 1637.9 | 1634.9 |
| 127.5° | 1753.0 | 1784.0 | 1773.0 | 1761.0 | 1753.0 |
| 130°   | 1868.0 | 1904.1 | 1899.0 | 1893.0 | 1882.1 |
| 132.5° | 1997.1 | 2025.2 | 2027.2 | 2013.1 | 2005.1 |
| 135°   | 2108.1 | 2139.2 | 2145.2 | 2142.2 | 2134.2 |
| 137.5° | 2232.3 | 2257.3 | 2262.2 | 2260.2 | 2248.3 |
| 140°   | 2341.3 | 2366.3 | 2380.3 | 2380.3 | 2369.4 |
| 142.5° | 2453.4 | 2478.4 | 2486.4 | 2489.4 | 2478.4 |
| 145°   | 2559.4 | 2579.4 | 2595.5 | 2598.4 | 2587.4 |
| 147.5° | 2654.5 | 2679.5 | 2691.5 | 2696.5 | 2685.5 |
| 150°   | 2752.6 | 2769.6 | 2780.5 | 2789.6 | 2780.5 |
| 152.5° | 2839.6 | 2856.6 | 2870.6 | 2881.7 | 2870.6 |
| 155°   | 2926.7 | 2934.6 | 2943.7 | 2957.7 | 2948.6 |
| 157.5° | 3001.7 | 3007.7 | 3012.6 | 3032.7 | 3018.6 |
| 160°   | 3068.7 | 3074.7 | 3077.7 | 3094.8 | 3082.8 |
| 162.5° | 3130.7 | 3130.7 | 3133.8 | 3152.8 | 3138.8 |
| 165°   | 3183.8 | 3180.7 | 3180.7 | 3200.8 | 3186.7 |
| 167.5° | 3231.8 | 3222.8 | 3222.8 | 3242.8 | 3228.8 |
| 170°   | 3267.8 | 3259.8 | 3256.9 | 3276.8 | 3259.8 |
| 172.5° | 3292.8 | 3284.8 | 3281.9 | 3301.9 | 3284.8 |
| 175°   | 3312.9 | 3304.8 | 3298.8 | 3318.9 | 3301.9 |
| 177.5° | 3323.8 | 3315.8 | 3309.8 | 3326.9 | 3309.8 |
| 180°   | 3318.9 | 3318.9 | 3318.9 | 3318.9 | 3318.9 |

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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 | 8.41             | 9.15  | 9.47  | 10.21 | 11.64 | 4.38           | 5.12 | 5.44 | 6.18 | 7.62  |
|                 | 3H   | 10.08            | 10.74 | 11.15 | 11.81 | 13.26 | 5.56           | 6.23 | 6.63 | 7.29 | 8.75  |
|                 | 4H   | 10.68            | 11.31 | 11.77 | 12.38 | 13.84 | 6.01           | 6.64 | 7.09 | 7.71 | 9.17  |
|                 | 6H   | 11.10            | 11.68 | 12.19 | 12.75 | 14.23 | 6.33           | 6.91 | 7.42 | 7.98 | 9.45  |
|                 | 8H   | 11.23            | 11.78 | 12.32 | 12.86 | 14.33 | 6.42           | 6.97 | 7.51 | 8.06 | 9.52  |
|                 | 12H  | 11.29            | 11.81 | 12.38 | 12.89 | 14.38 | 6.46           | 6.98 | 7.56 | 8.06 | 9.55  |
| 4H              | 2H   | 8.42             | 9.04  | 9.50  | 10.11 | 11.57 | 4.97           | 5.59 | 6.05 | 6.66 | 8.12  |
|                 | 3H   | 10.24            | 10.76 | 11.33 | 11.86 | 13.33 | 6.31           | 6.83 | 7.40 | 7.93 | 9.40  |
|                 | 4H   | 10.93            | 11.41 | 12.03 | 12.49 | 13.99 | 6.86           | 7.33 | 7.95 | 8.42 | 9.92  |
|                 | 6H   | 11.44            | 11.85 | 12.55 | 12.96 | 14.45 | 7.27           | 7.68 | 8.38 | 8.79 | 10.28 |
|                 | 8H   | 11.61            | 12.00 | 12.72 | 13.10 | 14.60 | 7.40           | 7.78 | 8.51 | 8.89 | 10.39 |
|                 | 12H  | 11.70            | 12.05 | 12.83 | 13.17 | 14.67 | 7.46           | 7.81 | 8.59 | 8.92 | 10.43 |
| 8H              | 4H   | 10.89            | 11.27 | 12.00 | 12.37 | 13.88 | 7.13           | 7.51 | 8.24 | 8.62 | 10.12 |
|                 | 6H   | 11.45            | 11.77 | 12.58 | 12.91 | 14.41 | 7.65           | 7.96 | 8.78 | 9.11 | 10.61 |
|                 | 8H   | 11.67            | 11.95 | 12.80 | 13.07 | 14.59 | 7.84           | 8.12 | 8.97 | 9.24 | 10.76 |
|                 | 12H  | 11.81            | 12.05 | 12.94 | 13.17 | 14.73 | 7.96           | 8.20 | 9.09 | 9.32 | 10.88 |
| 12H             | 4H   | 10.84            | 11.18 | 11.96 | 12.30 | 13.81 | 7.13           | 7.48 | 8.25 | 8.59 | 10.10 |
|                 | 6H   | 11.43            | 11.70 | 12.56 | 12.83 | 14.35 | 7.70           | 7.97 | 8.83 | 9.10 | 10.62 |
|                 | 8H   | 11.65            | 11.89 | 12.78 | 13.01 | 14.57 | 7.91           | 8.15 | 9.04 | 9.27 | 10.83 |