

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: P927938

Luminaire Tested: DFN2DIP-HX4F0-060D090US850-RLLONL

Issue Date: 12/12/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P927938  
REPORT IS A COMBINATION OF REPORTS P900914 AND P896187  
Test Lab: INNOVATION CENTER  
Issue Date: 12/12/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX4F0-060D090US850-RLLONL  
Description: 4 foot, Hexagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

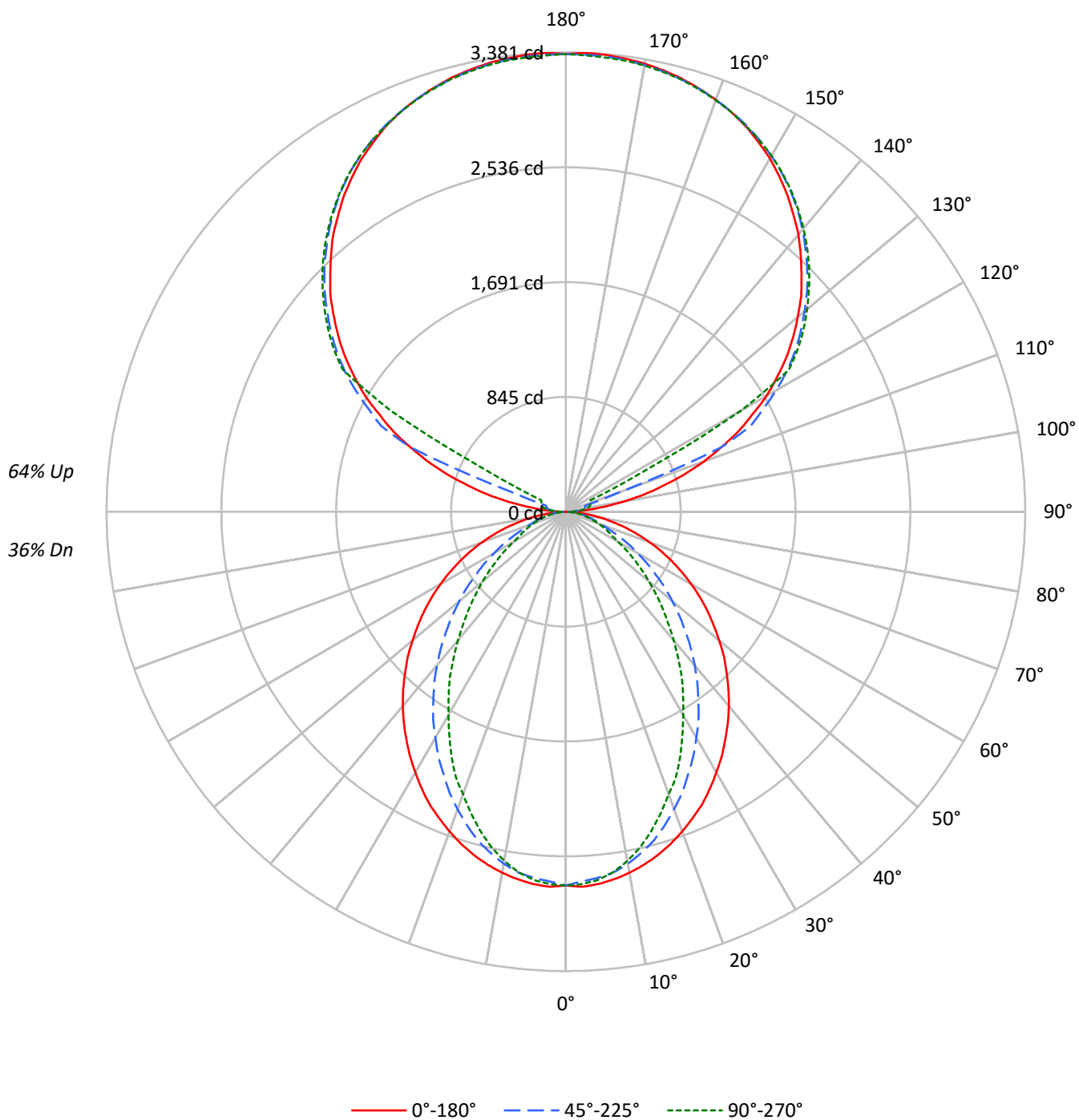
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 15537.1 lumens  
Efficiency: N/A  
Efficacy: 127.2 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): 122.1  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.099  
Total Harmonic Distortion (THDi): 0.979  
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   | 104 | 104 | 104 | 104 | 94 | 94 | 94 | 94 | 76 | 76 | 76 | 59 | 59 | 59 | 44 | 44 | 44 |
| 1   | 95  | 91  | 87  | 84  | 86 | 83 | 80 | 77 | 67 | 65 | 63 | 52 | 51 | 50 | 39 | 38 | 38 |
| 2   | 87  | 80  | 74  | 69  | 78 | 73 | 68 | 63 | 59 | 56 | 53 | 46 | 44 | 42 | 35 | 33 | 32 |
| 3   | 79  | 70  | 63  | 58  | 72 | 64 | 58 | 53 | 52 | 48 | 45 | 41 | 38 | 36 | 31 | 29 | 28 |
| 4   | 73  | 63  | 55  | 49  | 66 | 57 | 51 | 46 | 47 | 42 | 38 | 37 | 34 | 31 | 28 | 26 | 24 |
| 5   | 67  | 56  | 48  | 42  | 60 | 51 | 44 | 39 | 42 | 37 | 33 | 33 | 30 | 27 | 25 | 23 | 21 |
| 6   | 62  | 50  | 42  | 37  | 56 | 46 | 39 | 34 | 38 | 33 | 29 | 30 | 27 | 24 | 23 | 21 | 19 |
| 7   | 57  | 45  | 38  | 32  | 52 | 41 | 35 | 30 | 34 | 29 | 26 | 28 | 24 | 21 | 21 | 19 | 17 |
| 8   | 53  | 41  | 34  | 29  | 48 | 38 | 31 | 27 | 31 | 26 | 23 | 25 | 22 | 19 | 20 | 17 | 15 |
| 9   | 49  | 37  | 30  | 25  | 45 | 34 | 28 | 24 | 29 | 24 | 20 | 23 | 20 | 17 | 18 | 16 | 14 |
| 10  | 46  | 34  | 27  | 23  | 42 | 32 | 25 | 21 | 26 | 22 | 18 | 22 | 18 | 15 | 17 | 14 | 13 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2045 | 2045 | 2045 |
| 5°  | 2048 | 2013 | 2025 |
| 10° | 2028 | 1973 | 1960 |
| 15° | 2000 | 1908 | 1858 |
| 20° | 1964 | 1819 | 1733 |
| 25° | 1926 | 1718 | 1612 |
| 30° | 1875 | 1615 | 1459 |
| 35° | 1826 | 1504 | 1325 |
| 40° | 1775 | 1389 | 1170 |
| 45° | 1717 | 1262 | 1031 |
| 50° | 1656 | 1133 | 894  |
| 55° | 1593 | 996  | 763  |
| 60° | 1520 | 852  | 628  |
| 65° | 1436 | 706  | 566  |
| 70° | 1333 | 569  | 512  |
| 75° | 1205 | 502  | 466  |
| 80° | 1020 | 422  | 405  |
| 85° | 713  | 282  | 304  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 1730 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 257.7   | 1.7       |
| 10°-20°   | 707.6   | 4.6       |
| 20°-30°   | 993.4   | 6.4       |
| 30°-40°   | 1082.8  | 7.0       |
| 40°-50°   | 995.2   | 6.4       |
| 50°-60°   | 781.6   | 5.0       |
| 60°-70°   | 508.8   | 3.3       |
| 70°-80°   | 261.9   | 1.7       |
| 80°-90°   | 72.8    | 0.5       |
| 90°-100°  | 111.1   | 0.7       |
| 100°-110° | 414.0   | 2.7       |
| 110°-120° | 1098.2  | 7.1       |
| 120°-130° | 1821.4  | 11.7      |
| 130°-140° | 1934.7  | 12.5      |
| 140°-150° | 1798.1  | 11.6      |
| 150°-160° | 1445.6  | 9.3       |
| 160°-170° | 931.5   | 6.0       |
| 170°-180° | 320.6   | 2.1       |
| 0°-30°    | 1958.7  | 12.6      |
| 0°-40°    | 3041.5  | 19.6      |
| 0°-60°    | 4818.4  | 31.0      |
| 0°-90°    | 5661.8  | 36.4      |
| 90°-120°  | 1623.3  | 10.4      |
| 90°-150°  | 7177.5  | 46.2      |
| 90°-180°  | 9875.0  | 63.6      |
| 0°-180°   | 15537.1 | 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°  | 2    | 29    | 49   | 61    | 66   | 14   |
| 95°  | 158  | 78    | 95   | 107   | 105  | 188  |
| 105° | 741  | 814   | 149  | 175   | 185  | 792  |
| 115° | 1401 | 1443  | 1504 | 375   | 200  | 1380 |
| 125° | 1982 | 2013  | 2060 | 2077  | 2084 | 1767 |
| 135° | 2452 | 2491  | 2513 | 2538  | 2533 | 1894 |
| 145° | 2845 | 2842  | 2883 | 2900  | 2888 | 1779 |
| 155° | 3132 | 3110  | 3140 | 3154  | 3135 | 1443 |
| 165° | 3300 | 3286  | 3293 | 3310  | 3293 | 932  |
| 175° | 3376 | 3359  | 3364 | 3381  | 3356 | 321  |
| 180° | 3368 | 3368  | 3368 | 3368  | 3368 |      |

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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°    | 2.3    | 29.3   | 48.6   | 61.1   | 65.7   |
| 92.5°  | 61.1   | 51.2   | 58.4   | 63.4   | 65.7   |
| 95°    | 158.4  | 77.9   | 94.9   | 107.4  | 104.8  |
| 97.5°  | 285.1  | 85.4   | 124.2  | 131.6  | 134.0  |
| 100°   | 431.5  | 97.6   | 139.0  | 158.4  | 163.2  |
| 102.5° | 592.2  | 587.5  | 143.8  | 170.5  | 178.0  |
| 105°   | 740.9  | 814.2  | 148.7  | 175.4  | 185.2  |
| 107.5° | 914.0  | 974.8  | 153.7  | 180.3  | 190.2  |
| 110°   | 1079.8 | 1130.8 | 426.6  | 182.9  | 192.5  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1235.9 | 1279.6 | 1238.2 | 187.5  | 195.1  |
| 115°   | 1401.4 | 1442.8 | 1503.9 | 375.4  | 200.0  |
| 117.5° | 1545.3 | 1594.0 | 1635.6 | 1286.9 | 648.3  |
| 120°   | 1706.2 | 1742.7 | 1786.7 | 1815.9 | 1486.8 |
| 122.5° | 1842.6 | 1881.6 | 1930.5 | 1945.0 | 1947.6 |
| 125°   | 1981.5 | 2013.3 | 2059.6 | 2076.7 | 2083.9 |
| 127.5° | 2108.2 | 2142.4 | 2179.2 | 2203.5 | 2205.8 |
| 130°   | 2227.8 | 2266.9 | 2293.5 | 2320.4 | 2318.1 |
| 132.5° | 2349.6 | 2381.5 | 2408.1 | 2430.2 | 2427.8 |
| 135°   | 2452.1 | 2491.1 | 2512.9 | 2537.5 | 2532.6 |
| 137.5° | 2559.2 | 2588.4 | 2613.0 | 2637.3 | 2630.1 |
| 140°   | 2663.9 | 2683.7 | 2710.3 | 2732.2 | 2720.2 |
| 142.5° | 2752.0 | 2769.1 | 2800.6 | 2820.0 | 2807.9 |
| 145°   | 2844.6 | 2841.9 | 2883.4 | 2900.5 | 2888.3 |
| 147.5° | 2924.8 | 2917.6 | 2958.9 | 2971.1 | 2961.5 |
| 150°   | 3003.0 | 2985.9 | 3024.9 | 3039.3 | 3027.2 |
| 152.5° | 3068.6 | 3049.2 | 3085.7 | 3100.4 | 3083.4 |
| 155°   | 3132.0 | 3110.3 | 3139.5 | 3154.0 | 3134.6 |
| 157.5° | 3183.3 | 3163.9 | 3185.8 | 3202.9 | 3183.3 |
| 160°   | 3227.2 | 3212.4 | 3227.2 | 3241.7 | 3224.6 |
| 162.5° | 3266.0 | 3251.5 | 3263.7 | 3280.8 | 3258.8 |
| 165°   | 3300.2 | 3285.6 | 3293.0 | 3310.0 | 3293.0 |
| 167.5° | 3327.1 | 3312.4 | 3319.8 | 3336.9 | 3314.9 |
| 170°   | 3349.1 | 3334.3 | 3339.2 | 3356.3 | 3334.3 |
| 172.5° | 3363.6 | 3349.1 | 3353.9 | 3371.0 | 3349.1 |
| 175°   | 3375.7 | 3358.6 | 3363.6 | 3380.6 | 3356.3 |
| 177.5° | 3380.6 | 3363.6 | 3366.1 | 3383.2 | 3361.3 |
| 180°   | 3368.5 | 3368.5 | 3368.5 | 3368.5 | 3368.5 |

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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 | 8.22             | 8.95  | 9.29  | 10.02 | 11.47 | 4.19           | 4.92 | 5.26 | 5.99 | 7.45  |
|                 | 3H   | 9.89             | 10.54 | 10.97 | 11.62 | 13.09 | 5.37           | 6.03 | 6.45 | 7.11 | 8.58  |
|                 | 4H   | 10.49            | 11.11 | 11.58 | 12.19 | 13.67 | 5.82           | 6.44 | 6.91 | 7.52 | 9.00  |
|                 | 6H   | 10.91            | 11.48 | 12.01 | 12.56 | 14.05 | 6.14           | 6.71 | 7.24 | 7.79 | 9.28  |
|                 | 8H   | 11.03            | 11.58 | 12.14 | 12.67 | 14.16 | 6.23           | 6.77 | 7.33 | 7.87 | 9.35  |
|                 | 12H  | 11.09            | 11.61 | 12.20 | 12.70 | 14.21 | 6.27           | 6.78 | 7.38 | 7.87 | 9.38  |
| 4H              | 2H   | 8.22             | 8.84  | 9.32  | 9.92  | 11.40 | 4.78           | 5.39 | 5.87 | 6.47 | 7.95  |
|                 | 3H   | 10.05            | 10.56 | 11.15 | 11.67 | 13.16 | 6.12           | 6.63 | 7.22 | 7.74 | 9.23  |
|                 | 4H   | 10.73            | 11.21 | 11.84 | 12.30 | 13.82 | 6.66           | 7.14 | 7.77 | 8.23 | 9.75  |
|                 | 6H   | 11.25            | 11.65 | 12.36 | 12.77 | 14.27 | 7.08           | 7.48 | 8.20 | 8.60 | 10.11 |
|                 | 8H   | 11.42            | 11.80 | 12.54 | 12.91 | 14.43 | 7.21           | 7.59 | 8.32 | 8.70 | 10.22 |
|                 | 12H  | 11.51            | 11.85 | 12.64 | 12.98 | 14.50 | 7.27           | 7.61 | 8.40 | 8.73 | 10.26 |
| 8H              | 4H   | 10.70            | 11.07 | 11.81 | 12.18 | 13.71 | 6.94           | 7.31 | 8.05 | 8.43 | 9.95  |
|                 | 6H   | 11.26            | 11.57 | 12.40 | 12.72 | 14.24 | 7.45           | 7.77 | 8.59 | 8.92 | 10.44 |
|                 | 8H   | 11.48            | 11.75 | 12.62 | 12.88 | 14.42 | 7.65           | 7.92 | 8.79 | 9.05 | 10.59 |
|                 | 12H  | 11.61            | 11.85 | 12.76 | 12.98 | 14.56 | 7.76           | 8.00 | 8.91 | 9.13 | 10.71 |
| 12H             | 4H   | 10.64            | 10.98 | 11.78 | 12.11 | 13.63 | 6.94           | 7.28 | 8.07 | 8.40 | 9.93  |
|                 | 6H   | 11.23            | 11.51 | 12.38 | 12.64 | 14.18 | 7.50           | 7.78 | 8.65 | 8.91 | 10.45 |
|                 | 8H   | 11.45            | 11.69 | 12.60 | 12.82 | 14.40 | 7.71           | 7.95 | 8.86 | 9.08 | 10.66 |