

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: P912820

Luminaire Tested: DFN2DIP-TR4F0-060D090US850-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P912820  
REPORT IS A COMBINATION OF REPORTS P900464 AND P897293  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-TR4F0-060D090US850-RLLFLL  
Description: 4 foot, Triangle Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

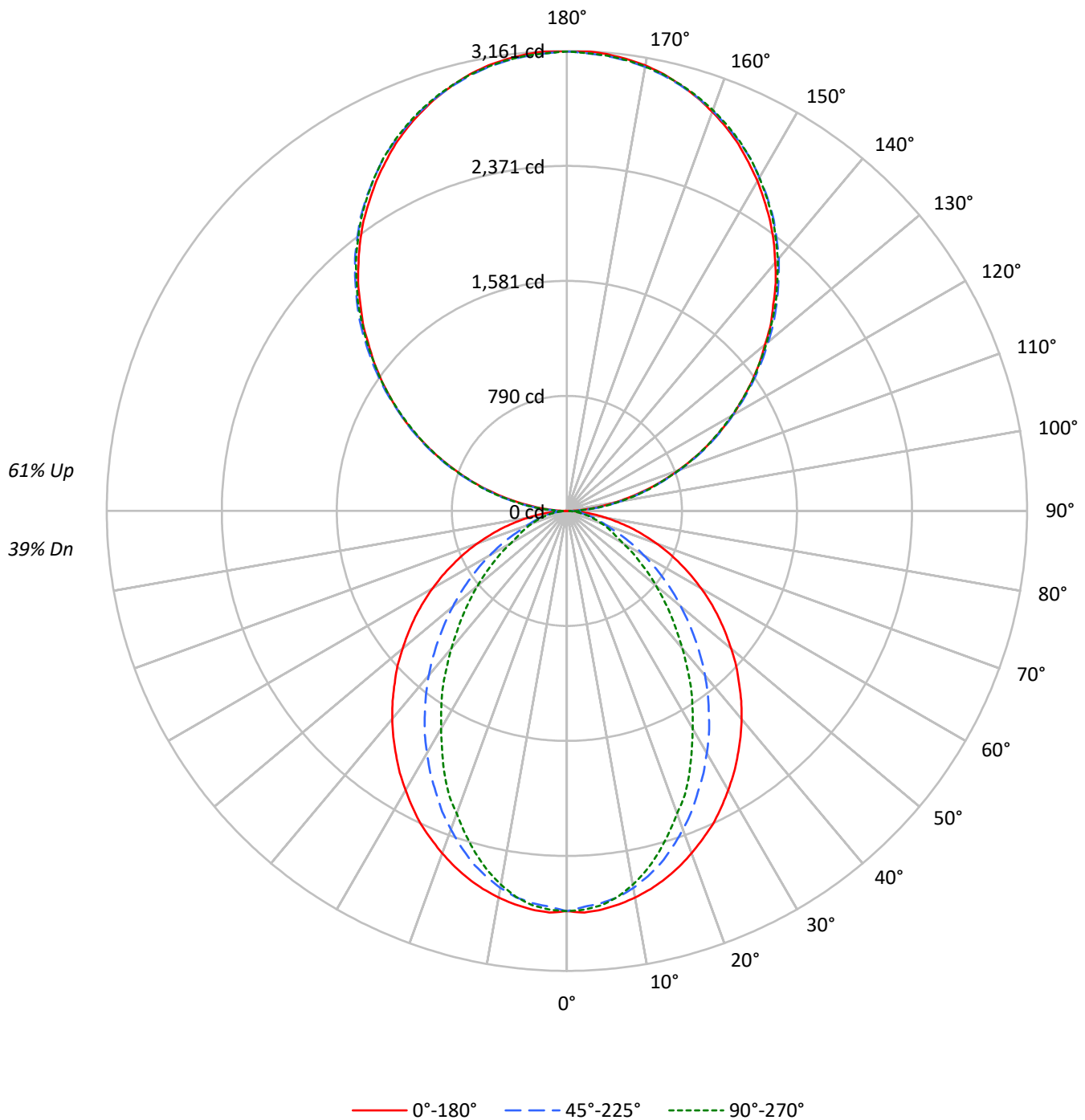
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 14489.1 lumens  
Efficiency: N/A  
Efficacy: 119.7 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-Indirect  
  
Input Watts (W): 121  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9781  
Total Harmonic Distortion (THDi): 0.075  
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: P912820

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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   | 105 | 105 | 105 | 105 | 95 | 95 | 95 | 95 | 77 | 77 | 77 | 61 | 61 | 61 | 46 | 46 | 46 |
| 1   | 96  | 92  | 88  | 85  | 87 | 83 | 80 | 78 | 68 | 66 | 64 | 54 | 53 | 51 | 41 | 40 | 40 |
| 2   | 87  | 80  | 75  | 70  | 79 | 73 | 68 | 64 | 60 | 57 | 54 | 48 | 46 | 44 | 37 | 35 | 34 |
| 3   | 80  | 71  | 64  | 58  | 73 | 65 | 59 | 54 | 53 | 49 | 46 | 43 | 40 | 37 | 33 | 31 | 29 |
| 4   | 73  | 63  | 55  | 50  | 66 | 58 | 51 | 46 | 48 | 43 | 39 | 38 | 35 | 32 | 30 | 27 | 26 |
| 5   | 67  | 56  | 48  | 43  | 61 | 52 | 45 | 40 | 43 | 38 | 34 | 35 | 31 | 28 | 27 | 24 | 22 |
| 6   | 62  | 51  | 43  | 37  | 56 | 46 | 40 | 35 | 39 | 33 | 30 | 31 | 28 | 25 | 25 | 22 | 20 |
| 7   | 57  | 46  | 38  | 33  | 52 | 42 | 35 | 30 | 35 | 30 | 26 | 29 | 25 | 22 | 22 | 20 | 18 |
| 8   | 53  | 41  | 34  | 29  | 49 | 38 | 32 | 27 | 32 | 27 | 23 | 26 | 22 | 20 | 21 | 18 | 16 |
| 9   | 50  | 38  | 31  | 26  | 45 | 35 | 29 | 24 | 29 | 24 | 21 | 24 | 20 | 18 | 19 | 17 | 15 |
| 10  | 46  | 35  | 28  | 23  | 42 | 32 | 26 | 22 | 27 | 22 | 19 | 22 | 19 | 16 | 18 | 15 | 13 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2185 | 2185 | 2185 |
| 5°  | 2188 | 2150 | 2164 |
| 10° | 2167 | 2108 | 2093 |
| 15° | 2137 | 2038 | 1984 |
| 20° | 2097 | 1942 | 1851 |
| 25° | 2057 | 1834 | 1722 |
| 30° | 2003 | 1724 | 1558 |
| 35° | 1950 | 1605 | 1414 |
| 40° | 1896 | 1482 | 1250 |
| 45° | 1833 | 1346 | 1100 |
| 50° | 1768 | 1209 | 954  |
| 55° | 1700 | 1062 | 814  |
| 60° | 1621 | 908  | 670  |
| 65° | 1531 | 752  | 603  |
| 70° | 1422 | 606  | 546  |
| 75° | 1284 | 534  | 496  |
| 80° | 1085 | 448  | 430  |
| 85° | 756  | 299  | 323  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 2460 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 257.7   | 1.8       |
| 10°-20°   | 707.6   | 4.9       |
| 20°-30°   | 993.4   | 6.9       |
| 30°-40°   | 1082.8  | 7.5       |
| 40°-50°   | 995.2   | 6.9       |
| 50°-60°   | 781.6   | 5.4       |
| 60°-70°   | 508.8   | 3.5       |
| 70°-80°   | 261.9   | 1.8       |
| 80°-90°   | 75.8    | 0.5       |
| 90°-100°  | 195.3   | 1.3       |
| 100°-110° | 620.6   | 4.3       |
| 110°-120° | 1062.1  | 7.3       |
| 120°-130° | 1396.8  | 9.6       |
| 130°-140° | 1567.9  | 10.8      |
| 140°-150° | 1537.5  | 10.6      |
| 150°-160° | 1289.7  | 8.9       |
| 160°-170° | 855.3   | 5.9       |
| 170°-180° | 299.0   | 2.1       |
| 0°-30°    | 1958.7  | 13.5      |
| 0°-40°    | 3041.5  | 21.0      |
| 0°-60°    | 4818.4  | 33.3      |
| 0°-90°    | 5664.9  | 39.1      |
| 90°-120°  | 1878.1  | 13.0      |
| 90°-150°  | 6380.2  | 44.0      |
| 90°-180°  | 8824.0  | 60.9      |
| 0°-180°   | 14489.1 | 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°  | 3    | 34    | 93   | 88    | 90   | 14   |
| 95°  | 139  | 166   | 170  | 170   | 166  | 155  |
| 105° | 573  | 580   | 586  | 591   | 591  | 605  |
| 115° | 1066 | 1081  | 1076 | 1074  | 1066 | 1054 |
| 125° | 1550 | 1574  | 1566 | 1558  | 1555 | 1385 |
| 135° | 2005 | 2035  | 2040 | 2038  | 2030 | 1550 |
| 145° | 2434 | 2453  | 2468 | 2471  | 2461 | 1521 |
| 155° | 2784 | 2791  | 2800 | 2813  | 2805 | 1281 |
| 165° | 3028 | 3025  | 3025 | 3044  | 3031 | 854  |
| 175° | 3151 | 3143  | 3138 | 3157  | 3140 | 299  |
| 180° | 3157 | 3157  | 3157 | 3157  | 3157 |      |

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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°    | 2.9    | 34.3   | 93.3   | 87.5   | 90.4   |
| 92.5°  | 59.0   | 80.0   | 82.8   | 85.6   | 85.6   |
| 95°    | 139.0  | 165.6  | 170.3  | 170.3  | 165.6  |
| 97.5°  | 231.2  | 256.0  | 266.5  | 266.5  | 266.5  |
| 100°   | 337.8  | 359.8  | 367.3  | 367.3  | 364.5  |
| 102.5° | 450.1  | 466.3  | 476.8  | 479.6  | 476.8  |
| 105°   | 572.9  | 580.5  | 586.2  | 591.0  | 591.0  |
| 107.5° | 694.7  | 706.1  | 706.1  | 708.0  | 694.7  |
| 110°   | 812.7  | 828.0  | 828.0  | 828.0  | 820.3  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 940.2  | 956.4  | 953.5  | 946.0  | 940.2  |
| 115°   | 1065.9 | 1081.1 | 1076.3 | 1073.5 | 1065.9 |
| 117.5° | 1190.5 | 1211.5 | 1198.2 | 1190.5 | 1182.9 |
| 120°   | 1316.2 | 1337.0 | 1316.2 | 1316.2 | 1307.5 |
| 122.5° | 1430.3 | 1457.0 | 1443.7 | 1436.0 | 1430.3 |
| 125°   | 1550.3 | 1574.0 | 1566.5 | 1557.8 | 1555.0 |
| 127.5° | 1667.3 | 1696.8 | 1686.3 | 1674.9 | 1667.3 |
| 130°   | 1776.7 | 1811.0 | 1806.2 | 1800.5 | 1790.0 |
| 132.5° | 1899.5 | 1926.1 | 1928.0 | 1914.7 | 1907.1 |
| 135°   | 2005.1 | 2034.6 | 2040.3 | 2037.5 | 2029.9 |
| 137.5° | 2123.1 | 2146.9 | 2151.7 | 2149.8 | 2138.4 |
| 140°   | 2226.9 | 2250.6 | 2263.9 | 2263.9 | 2253.5 |
| 142.5° | 2333.4 | 2357.2 | 2364.8 | 2367.7 | 2357.2 |
| 145°   | 2434.4 | 2453.3 | 2468.5 | 2471.4 | 2461.0 |
| 147.5° | 2524.7 | 2548.5 | 2559.9 | 2564.7 | 2554.2 |
| 150°   | 2618.0 | 2634.2 | 2644.6 | 2653.2 | 2644.6 |
| 152.5° | 2700.7 | 2716.9 | 2730.2 | 2740.8 | 2730.2 |
| 155°   | 2783.6 | 2791.1 | 2799.8 | 2813.1 | 2804.6 |
| 157.5° | 2854.9 | 2860.7 | 2865.4 | 2884.4 | 2871.1 |
| 160°   | 2918.7 | 2924.4 | 2927.3 | 2943.4 | 2932.0 |
| 162.5° | 2977.7 | 2977.7 | 2980.5 | 2998.6 | 2985.3 |
| 165°   | 3028.1 | 3025.2 | 3025.2 | 3044.3 | 3031.0 |
| 167.5° | 3073.8 | 3065.3 | 3065.3 | 3084.2 | 3070.9 |
| 170°   | 3108.1 | 3100.4 | 3097.7 | 3116.6 | 3100.4 |
| 172.5° | 3131.8 | 3124.3 | 3121.4 | 3140.5 | 3124.3 |
| 175°   | 3150.9 | 3143.2 | 3137.6 | 3156.7 | 3140.5 |
| 177.5° | 3161.3 | 3153.8 | 3148.0 | 3164.2 | 3148.0 |
| 180°   | 3156.7 | 3156.7 | 3156.7 | 3156.7 | 3156.7 |

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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 | 8.74             | 9.49  | 9.80  | 10.54 | 11.97 | 4.72           | 5.47 | 5.77 | 6.52 | 7.94  |
|                 | 3H   | 10.41            | 11.08 | 11.48 | 12.14 | 13.58 | 5.90           | 6.57 | 6.96 | 7.63 | 9.07  |
|                 | 4H   | 11.02            | 11.65 | 12.09 | 12.72 | 14.16 | 6.35           | 6.98 | 7.42 | 8.04 | 9.49  |
|                 | 6H   | 11.44            | 12.02 | 12.52 | 13.09 | 14.54 | 6.67           | 7.25 | 7.75 | 8.32 | 9.77  |
|                 | 8H   | 11.56            | 12.12 | 12.65 | 13.20 | 14.65 | 6.75           | 7.31 | 7.84 | 8.39 | 9.84  |
|                 | 12H  | 11.62            | 12.15 | 12.71 | 13.22 | 14.70 | 6.80           | 7.32 | 7.89 | 8.40 | 9.87  |
| 4H              | 2H   | 8.75             | 9.39  | 9.83  | 10.45 | 11.90 | 5.30           | 5.94 | 6.38 | 7.00 | 8.45  |
|                 | 3H   | 10.57            | 11.10 | 11.66 | 12.19 | 13.65 | 6.65           | 7.17 | 7.73 | 8.26 | 9.72  |
|                 | 4H   | 11.26            | 11.75 | 12.35 | 12.83 | 14.31 | 7.19           | 7.68 | 8.28 | 8.76 | 10.24 |
|                 | 6H   | 11.77            | 12.19 | 12.87 | 13.29 | 14.77 | 7.61           | 8.02 | 8.71 | 9.13 | 10.60 |
|                 | 8H   | 11.95            | 12.33 | 13.05 | 13.43 | 14.92 | 7.74           | 8.12 | 8.84 | 9.22 | 10.71 |
|                 | 12H  | 12.04            | 12.39 | 13.15 | 13.50 | 14.99 | 7.80           | 8.15 | 8.91 | 9.26 | 10.75 |
| 8H              | 4H   | 11.22            | 11.61 | 12.32 | 12.71 | 14.20 | 7.47           | 7.85 | 8.57 | 8.95 | 10.44 |
|                 | 6H   | 11.79            | 12.11 | 12.91 | 13.24 | 14.73 | 7.98           | 8.30 | 9.10 | 9.44 | 10.93 |
|                 | 8H   | 12.00            | 12.28 | 13.13 | 13.40 | 14.91 | 8.17           | 8.45 | 9.30 | 9.57 | 11.08 |
|                 | 12H  | 12.14            | 12.38 | 13.27 | 13.50 | 15.04 | 8.29           | 8.54 | 9.42 | 9.65 | 11.20 |
| 12H             | 4H   | 11.17            | 11.52 | 12.29 | 12.63 | 14.13 | 7.47           | 7.82 | 8.58 | 8.93 | 10.42 |
|                 | 6H   | 11.76            | 12.04 | 12.89 | 13.16 | 14.67 | 8.03           | 8.31 | 9.16 | 9.43 | 10.94 |
|                 | 8H   | 11.98            | 12.23 | 13.11 | 13.34 | 14.88 | 8.24           | 8.48 | 9.37 | 9.60 | 11.14 |