

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: P906470

Luminaire Tested: DFN2DIP-SQ3F0-070D090US835-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P906470  
REPORT IS A COMBINATION OF REPORTS P899958 AND P896733  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ3F0-070D090US835-RLLFLL  
Description: 3 foot, Square Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

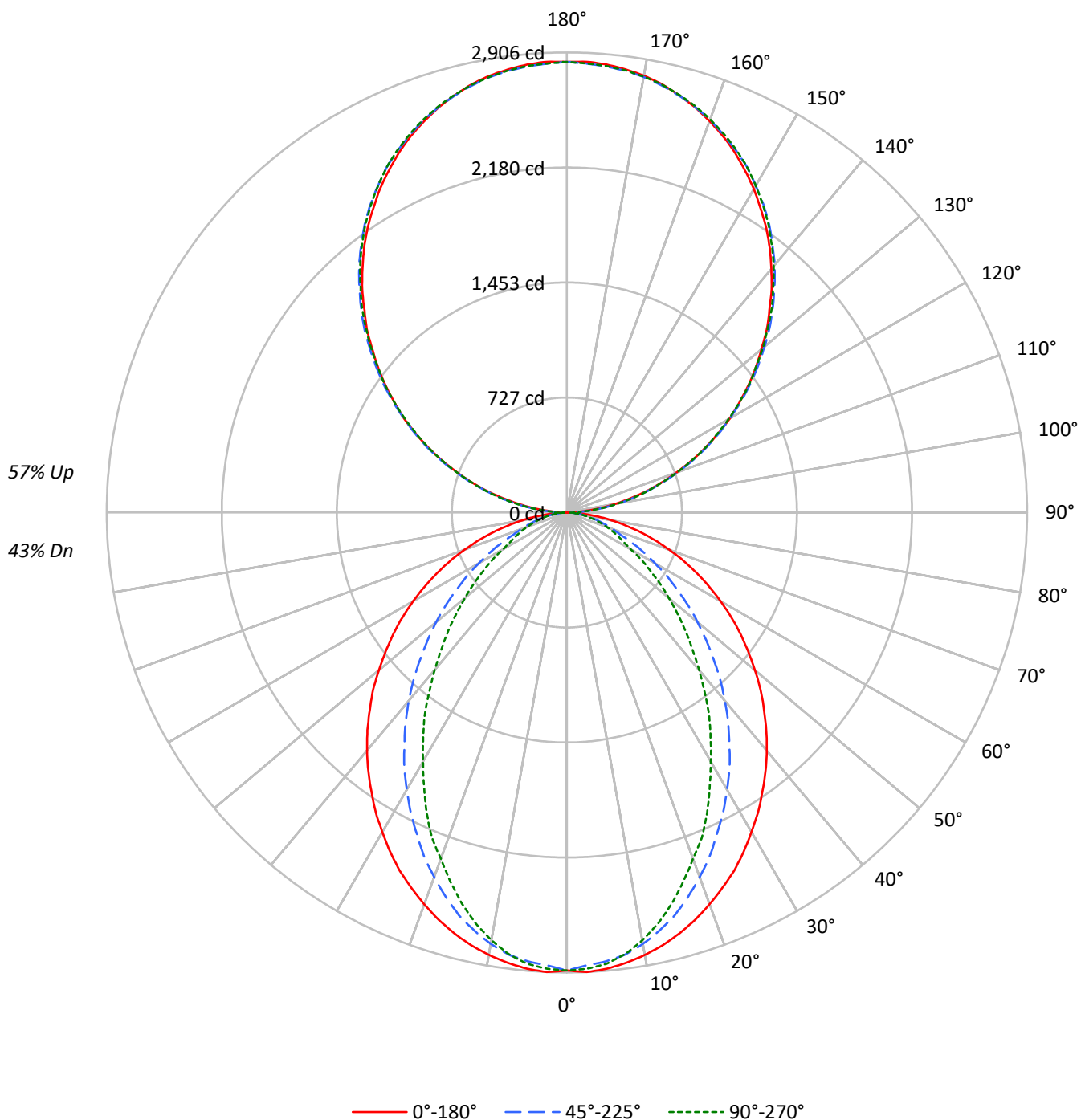
Lumens per Lamp: N/A  
Luminaire Lumens: 13915.0 lumens  
Efficiency: N/A  
Efficacy: 103.8 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.06' x L: 3.06' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 134.1  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9963  
Total Harmonic Distortion (THDi): 0.065  
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: P906470

CATALOG NUMBER: DFN2DIP-SQ3F0-070D090US835-RLFL

**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 | 96 | 96 | 96 | 96 | 79 | 79 | 79 | 64 | 64 | 64 | 50 | 50 | 50 |
| 1   | 97  | 92  | 89  | 85  | 88 | 85 | 82 | 79 | 70 | 68 | 66 | 57 | 55 | 54 | 44 | 43 | 43 |
| 2   | 88  | 81  | 75  | 70  | 80 | 74 | 69 | 65 | 62 | 58 | 55 | 50 | 48 | 46 | 40 | 38 | 36 |
| 3   | 81  | 72  | 65  | 59  | 74 | 66 | 60 | 55 | 55 | 51 | 47 | 45 | 42 | 39 | 35 | 33 | 32 |
| 4   | 74  | 64  | 56  | 50  | 68 | 59 | 52 | 47 | 49 | 44 | 40 | 40 | 37 | 34 | 32 | 30 | 28 |
| 5   | 68  | 57  | 49  | 43  | 62 | 52 | 46 | 41 | 44 | 39 | 35 | 36 | 32 | 30 | 29 | 26 | 24 |
| 6   | 63  | 51  | 43  | 38  | 57 | 47 | 40 | 35 | 40 | 35 | 31 | 33 | 29 | 26 | 26 | 24 | 22 |
| 7   | 58  | 46  | 39  | 33  | 53 | 43 | 36 | 31 | 36 | 31 | 27 | 30 | 26 | 23 | 24 | 21 | 19 |
| 8   | 54  | 42  | 35  | 29  | 49 | 39 | 32 | 28 | 33 | 28 | 24 | 28 | 24 | 21 | 22 | 19 | 17 |
| 9   | 50  | 38  | 31  | 26  | 46 | 36 | 29 | 25 | 30 | 25 | 22 | 25 | 22 | 19 | 21 | 18 | 16 |
| 10  | 47  | 35  | 28  | 24  | 43 | 33 | 27 | 22 | 28 | 23 | 20 | 23 | 20 | 17 | 19 | 16 | 14 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3315 | 3315 | 3315 |
| 5°  | 3318 | 3260 | 3282 |
| 10° | 3283 | 3194 | 3174 |
| 15° | 3236 | 3086 | 3008 |
| 20° | 3174 | 2939 | 2805 |
| 25° | 3111 | 2774 | 2608 |
| 30° | 3026 | 2605 | 2360 |
| 35° | 2943 | 2423 | 2141 |
| 40° | 2859 | 2236 | 1891 |
| 45° | 2761 | 2028 | 1664 |
| 50° | 2660 | 1818 | 1442 |
| 55° | 2553 | 1595 | 1230 |
| 60° | 2431 | 1361 | 1011 |
| 65° | 2289 | 1124 | 909  |
| 70° | 2117 | 903  | 821  |
| 75° | 1901 | 791  | 744  |
| 80° | 1589 | 657  | 642  |
| 85° | 1077 | 428  | 476  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 2862 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 271.1   | 1.9       |
| 10°-20°   | 744.3   | 5.3       |
| 20°-30°   | 1045.0  | 7.5       |
| 30°-40°   | 1139.2  | 8.2       |
| 40°-50°   | 1047.0  | 7.5       |
| 50°-60°   | 822.3   | 5.9       |
| 60°-70°   | 535.2   | 3.8       |
| 70°-80°   | 275.5   | 2.0       |
| 80°-90°   | 78.4    | 0.6       |
| 90°-100°  | 176.1   | 1.3       |
| 100°-110° | 559.6   | 4.0       |
| 110°-120° | 957.7   | 6.9       |
| 120°-130° | 1259.5  | 9.1       |
| 130°-140° | 1413.8  | 10.2      |
| 140°-150° | 1386.4  | 10.0      |
| 150°-160° | 1163.0  | 8.4       |
| 160°-170° | 771.2   | 5.5       |
| 170°-180° | 269.6   | 1.9       |
| 0°-30°    | 2060.5  | 14.8      |
| 0°-40°    | 3199.7  | 23.0      |
| 0°-60°    | 5068.9  | 36.4      |
| 0°-90°    | 5958.1  | 42.8      |
| 90°-120°  | 1693.5  | 12.2      |
| 90°-150°  | 5753.1  | 41.3      |
| 90°-180°  | 7957.0  | 57.2      |
| 0°-180°   | 13915.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2893 | 2893  | 2893 | 2893  | 2893 |      |
| 5°   | 2893 | 2880  | 2846 | 2870  | 2862 | 274  |
| 15°  | 2752 | 2723  | 2634 | 2584  | 2558 | 775  |
| 25°  | 2498 | 2414  | 2241 | 2134  | 2094 | 1149 |
| 35°  | 2152 | 2019  | 1788 | 1623  | 1566 | 1347 |
| 45°  | 1760 | 1584  | 1309 | 1123  | 1060 | 1359 |
| 55°  | 1338 | 1134  | 851  | 694   | 644  | 1195 |
| 65°  | 903  | 691   | 456  | 367   | 359  | 896  |
| 75°  | 482  | 298   | 209  | 191   | 189  | 509  |
| 85°  | 112  | 58    | 50   | 50    | 50   | 129  |
| 90°  | 3    | 31    | 84   | 79    | 82   | 14   |
| 95°  | 125  | 149   | 154  | 154   | 149  | 139  |
| 105° | 517  | 523   | 529  | 533   | 533  | 545  |
| 115° | 961  | 975   | 970  | 968   | 961  | 951  |
| 125° | 1398 | 1419  | 1412 | 1405  | 1402 | 1249 |
| 135° | 1808 | 1835  | 1840 | 1837  | 1830 | 1398 |
| 145° | 2195 | 2212  | 2226 | 2228  | 2219 | 1372 |
| 155° | 2510 | 2517  | 2525 | 2537  | 2529 | 1155 |
| 165° | 2730 | 2728  | 2728 | 2745  | 2733 | 770  |
| 175° | 2841 | 2834  | 2829 | 2846  | 2832 | 270  |
| 180° | 2846 | 2846  | 2846 | 2846  | 2846 |      |

TEST NUMBER: P906470

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2893.1 | 2893.1 | 2893.1 | 2893.1 | 2893.1 |
| 2.5°   | 2906.1 | 2893.1 | 2864.2 | 2890.6 | 2885.3 |
| 5°     | 2893.1 | 2880.0 | 2845.9 | 2869.5 | 2861.7 |
| 7.5°   | 2869.5 | 2853.9 | 2817.3 | 2827.5 | 2814.5 |
| 10°    | 2838.1 | 2819.8 | 2767.5 | 2759.5 | 2743.9 |
| 12.5°  | 2798.9 | 2775.3 | 2704.5 | 2688.9 | 2660.0 |
| 15°    | 2751.7 | 2722.8 | 2633.9 | 2584.2 | 2558.1 |
| 17.5°  | 2696.7 | 2654.8 | 2544.8 | 2487.2 | 2445.3 |
| 20°    | 2633.9 | 2581.4 | 2450.6 | 2385.3 | 2327.5 |
| 22.5°  | 2565.9 | 2505.6 | 2353.6 | 2264.7 | 2225.6 |
| 25°    | 2497.8 | 2413.9 | 2241.1 | 2133.9 | 2094.5 |
| 27.5°  | 2416.7 | 2327.5 | 2136.4 | 2013.4 | 1953.1 |
| 30°    | 2330.3 | 2230.6 | 2021.1 | 1887.8 | 1817.0 |
| 32.5°  | 2246.4 | 2125.9 | 1911.4 | 1754.2 | 1688.6 |
| 35°    | 2152.2 | 2018.6 | 1788.4 | 1623.4 | 1565.6 |
| 37.5°  | 2060.6 | 1916.4 | 1673.1 | 1492.2 | 1427.0 |
| 40°    | 1963.6 | 1806.7 | 1552.5 | 1366.7 | 1298.6 |
| 42.5°  | 1864.2 | 1696.7 | 1432.2 | 1238.3 | 1173.1 |
| 45°    | 1759.5 | 1583.9 | 1309.2 | 1123.1 | 1060.3 |
| 47.5°  | 1660.0 | 1474.2 | 1191.4 | 1005.3 | 947.8  |
| 50°    | 1550.0 | 1364.2 | 1076.1 | 895.3  | 840.6  |
| 52.5°  | 1442.5 | 1246.1 | 966.1  | 793.3  | 743.6  |
| 55°    | 1337.8 | 1133.6 | 850.8  | 693.9  | 644.2  |
| 57.5°  | 1230.6 | 1021.1 | 748.9  | 602.2  | 560.3  |
| 60°    | 1120.6 | 911.1  | 641.4  | 508.1  | 466.1  |
| 62.5°  | 1013.3 | 803.9  | 549.7  | 424.2  | 403.3  |
| 65°    | 903.3  | 691.1  | 455.6  | 366.7  | 358.6  |
| 67.5°  | 798.6  | 586.4  | 366.7  | 321.9  | 314.2  |
| 70°    | 688.6  | 484.4  | 303.6  | 277.5  | 266.9  |
| 72.5°  | 583.9  | 390.0  | 253.9  | 233.1  | 227.8  |
| 75°    | 481.7  | 298.3  | 209.4  | 191.1  | 188.6  |
| 77.5°  | 379.7  | 211.9  | 165.0  | 154.4  | 149.2  |
| 80°    | 285.3  | 151.9  | 125.6  | 115.3  | 115.3  |
| 82.5°  | 198.9  | 102.2  | 86.4   | 81.1   | 81.1   |
| 85°    | 112.5  | 57.5   | 49.7   | 49.7   | 49.7   |
| 87.5°  | 41.9   | 20.8   | 20.8   | 18.3   | 18.3   |
| 90°    | 2.6    | 30.9   | 84.1   | 78.9   | 81.5   |
| 92.5°  | 53.2   | 72.1   | 74.7   | 77.2   | 77.2   |
| 95°    | 125.3  | 149.3  | 153.6  | 153.6  | 149.3  |
| 97.5°  | 208.5  | 230.8  | 240.3  | 240.3  | 240.3  |
| 100°   | 304.6  | 324.4  | 331.2  | 331.2  | 328.7  |
| 102.5° | 405.9  | 420.5  | 429.9  | 432.5  | 429.9  |
| 105°   | 516.6  | 523.4  | 528.6  | 532.9  | 532.9  |
| 107.5° | 626.4  | 636.7  | 636.7  | 638.4  | 626.4  |
| 110°   | 732.8  | 746.6  | 746.6  | 746.6  | 739.7  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 847.8  | 862.4  | 859.8  | 853.0  | 847.8  |
| 115°   | 961.1  | 974.8  | 970.5  | 968.0  | 961.1  |
| 117.5° | 1073.5 | 1092.4 | 1080.4 | 1073.5 | 1066.6 |
| 120°   | 1186.8 | 1205.6 | 1186.8 | 1186.8 | 1179.0 |
| 122.5° | 1289.7 | 1313.8 | 1301.8 | 1294.9 | 1289.7 |
| 125°   | 1397.9 | 1419.3 | 1412.5 | 1404.7 | 1402.2 |
| 127.5° | 1503.4 | 1530.0 | 1520.6 | 1510.3 | 1503.4 |
| 130°   | 1602.1 | 1633.0 | 1628.7 | 1623.5 | 1614.1 |
| 132.5° | 1712.8 | 1736.8 | 1738.5 | 1726.5 | 1719.7 |
| 135°   | 1808.0 | 1834.6 | 1839.8 | 1837.2 | 1830.4 |
| 137.5° | 1914.4 | 1935.9 | 1940.2 | 1938.5 | 1928.2 |
| 140°   | 2008.0 | 2029.4 | 2041.4 | 2041.4 | 2032.0 |
| 142.5° | 2104.1 | 2125.5 | 2132.4 | 2135.0 | 2125.5 |
| 145°   | 2195.1 | 2212.2 | 2225.9 | 2228.5 | 2219.1 |
| 147.5° | 2276.6 | 2298.0 | 2308.3 | 2312.6 | 2303.2 |
| 150°   | 2360.7 | 2375.3 | 2384.7 | 2392.4 | 2384.7 |
| 152.5° | 2435.3 | 2449.9 | 2461.9 | 2471.4 | 2461.9 |
| 155°   | 2510.0 | 2516.8 | 2524.6 | 2536.6 | 2528.9 |
| 157.5° | 2574.3 | 2579.5 | 2583.8 | 2600.9 | 2588.9 |
| 160°   | 2631.8 | 2637.0 | 2639.6 | 2654.1 | 2643.8 |
| 162.5° | 2685.0 | 2685.0 | 2687.6 | 2703.9 | 2691.9 |
| 165°   | 2730.5 | 2727.9 | 2727.9 | 2745.1 | 2733.1 |
| 167.5° | 2771.7 | 2764.0 | 2764.0 | 2781.1 | 2769.1 |
| 170°   | 2802.6 | 2795.7 | 2793.2 | 2810.3 | 2795.7 |
| 172.5° | 2824.0 | 2817.2 | 2814.6 | 2831.8 | 2817.2 |
| 175°   | 2841.2 | 2834.3 | 2829.2 | 2846.4 | 2831.8 |
| 177.5° | 2850.6 | 2843.8 | 2838.6 | 2853.2 | 2838.6 |
| 180°   | 2846.4 | 2846.4 | 2846.4 | 2846.4 | 2846.4 |

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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 | 10.57            | 11.34 | 11.59 | 12.37 | 13.74 | 6.53           | 7.30  | 7.55  | 8.33  | 9.70  |
|                 | 3H   | 12.23            | 12.93 | 13.27 | 13.96 | 15.36 | 7.70           | 8.40  | 8.74  | 9.43  | 10.82 |
|                 | 4H   | 12.84            | 13.49 | 13.88 | 14.53 | 15.93 | 8.15           | 8.80  | 9.19  | 9.84  | 11.24 |
|                 | 6H   | 13.25            | 13.86 | 14.31 | 14.90 | 16.31 | 8.46           | 9.06  | 9.51  | 10.11 | 11.52 |
|                 | 8H   | 13.37            | 13.95 | 14.43 | 15.01 | 16.41 | 8.55           | 9.12  | 9.60  | 10.18 | 11.58 |
|                 | 12H  | 13.43            | 13.98 | 14.50 | 15.03 | 16.46 | 8.58           | 9.13  | 9.65  | 10.18 | 11.61 |
| 4H              | 2H   | 10.57            | 11.23 | 11.63 | 12.27 | 13.67 | 7.11           | 7.77  | 8.16  | 8.81  | 10.21 |
|                 | 3H   | 12.39            | 12.94 | 13.45 | 14.01 | 15.42 | 8.45           | 9.00  | 9.51  | 10.06 | 11.47 |
|                 | 4H   | 13.08            | 13.58 | 14.14 | 14.64 | 16.07 | 8.99           | 9.49  | 10.06 | 10.55 | 11.98 |
|                 | 6H   | 13.59            | 14.02 | 14.66 | 15.10 | 16.53 | 9.40           | 9.83  | 10.47 | 10.91 | 12.34 |
|                 | 8H   | 13.76            | 14.16 | 14.83 | 15.23 | 16.68 | 9.52           | 9.92  | 10.60 | 11.00 | 12.44 |
|                 | 12H  | 13.85            | 14.21 | 14.94 | 15.30 | 16.75 | 9.58           | 9.94  | 10.67 | 11.03 | 12.48 |
| 8H              | 4H   | 13.04            | 13.44 | 14.12 | 14.51 | 15.96 | 9.26           | 9.66  | 10.34 | 10.74 | 12.18 |
|                 | 6H   | 13.60            | 13.93 | 14.70 | 15.05 | 16.49 | 9.77           | 10.10 | 10.87 | 11.22 | 12.66 |
|                 | 8H   | 13.81            | 14.10 | 14.92 | 15.20 | 16.66 | 9.96           | 10.25 | 11.06 | 11.34 | 12.81 |
|                 | 12H  | 13.95            | 14.20 | 15.05 | 15.29 | 16.79 | 10.07          | 10.32 | 11.18 | 11.42 | 12.92 |
| 12H             | 4H   | 12.99            | 13.35 | 14.08 | 14.44 | 15.89 | 9.26           | 9.63  | 10.36 | 10.71 | 12.16 |
|                 | 6H   | 13.58            | 13.86 | 14.68 | 14.96 | 16.42 | 9.82           | 10.11 | 10.92 | 11.21 | 12.67 |
|                 | 8H   | 13.79            | 14.04 | 14.90 | 15.14 | 16.64 | 10.02          | 10.28 | 11.13 | 11.37 | 12.87 |