

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: P906898

Luminaire Tested: DFN2DIP-SQ4F0-120D100US835-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P906898  
REPORT IS A COMBINATION OF REPORTS P900144 AND P896915  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ4F0-120D100US835-RLFL  
Description: 4 foot, Square Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

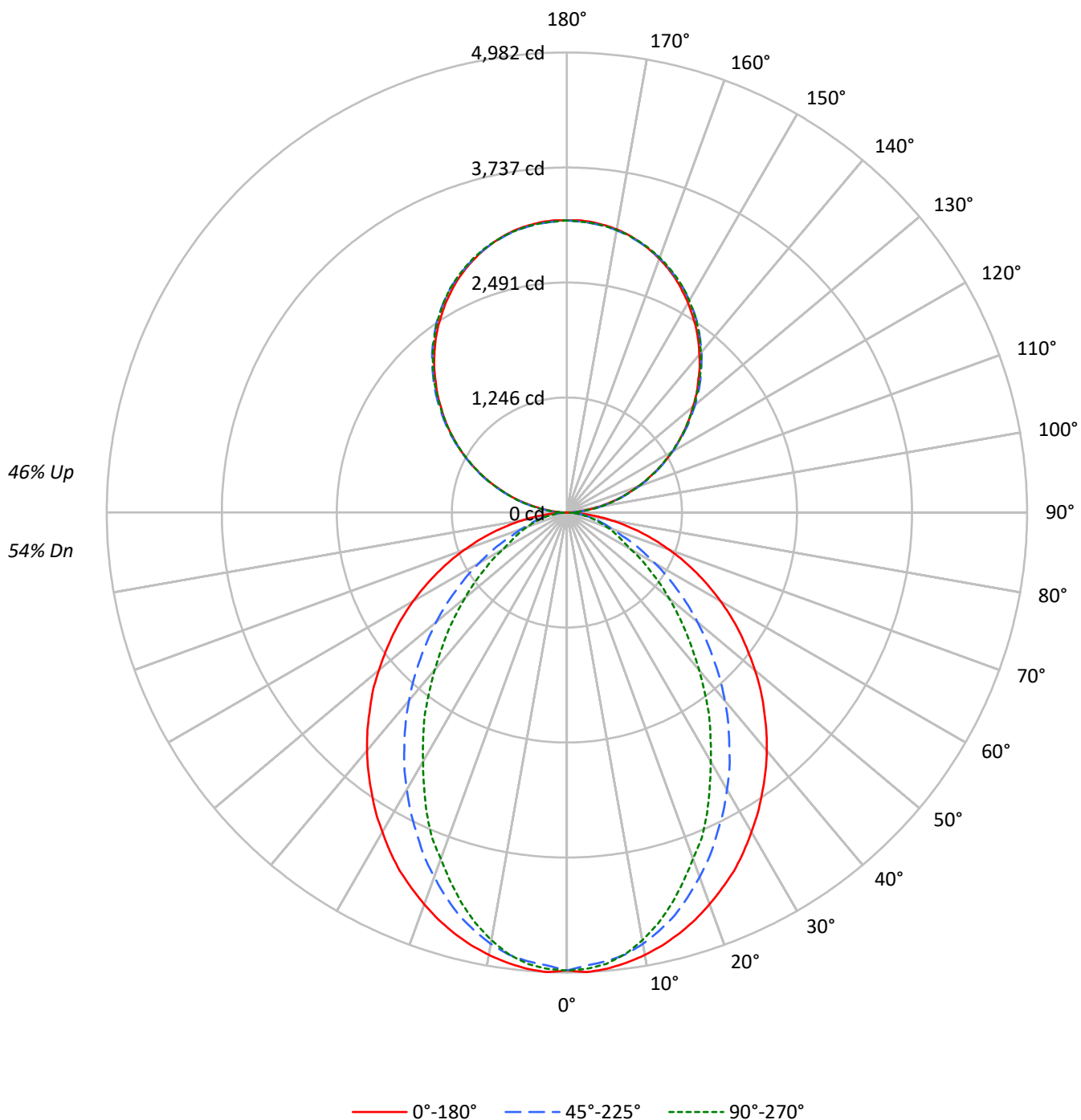
Lumens per Lamp: N/A  
Luminaire Lumens: 19050.0 lumens  
Efficiency: N/A  
Efficacy: 99.1 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.92' x L: 3.92' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 192.3  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9933  
Total Harmonic Distortion (THDi): 0.066  
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  | 84  | 78  | 73  | 84  | 78  | 73  | 68  | 67 | 63 | 60 | 57 | 54 | 52 | 48 | 46 | 44 |
| 3   | 83  | 74  | 67  | 61  | 77  | 69  | 63  | 58  | 59 | 55 | 51 | 51 | 47 | 44 | 43 | 40 | 38 |
| 4   | 76  | 66  | 58  | 52  | 71  | 61  | 55  | 49  | 53 | 48 | 44 | 46 | 42 | 38 | 38 | 36 | 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 | 29 | 26 |
| 7   | 60  | 48  | 40  | 35  | 56  | 45  | 38  | 33  | 39 | 34 | 30 | 34 | 30 | 27 | 29 | 26 | 23 |
| 8   | 56  | 44  | 36  | 31  | 52  | 41  | 34  | 30  | 36 | 31 | 27 | 31 | 27 | 24 | 27 | 24 | 21 |
| 9   | 52  | 40  | 33  | 28  | 48  | 38  | 31  | 27  | 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 | 18 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3480 | 3480 | 3480 |
| 5°  | 3486 | 3425 | 3448 |
| 10° | 3451 | 3359 | 3337 |
| 15° | 3403 | 3249 | 3164 |
| 20° | 3341 | 3096 | 2952 |
| 25° | 3276 | 2925 | 2747 |
| 30° | 3190 | 2750 | 2487 |
| 35° | 3105 | 2561 | 2259 |
| 40° | 3019 | 2366 | 1996 |
| 45° | 2919 | 2149 | 1759 |
| 50° | 2815 | 1931 | 1527 |
| 55° | 2707 | 1697 | 1303 |
| 60° | 2582 | 1452 | 1074 |
| 65° | 2438 | 1204 | 968  |
| 70° | 2263 | 971  | 877  |
| 75° | 2044 | 858  | 800  |
| 80° | 1726 | 722  | 697  |
| 85° | 1202 | 486  | 531  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2919 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 464.8   | 2.4       |
| 10°-20°   | 1276.0  | 6.7       |
| 20°-30°   | 1791.5  | 9.4       |
| 30°-40°   | 1952.8  | 10.3      |
| 40°-50°   | 1794.9  | 9.4       |
| 50°-60°   | 1409.6  | 7.4       |
| 60°-70°   | 917.5   | 4.8       |
| 70°-80°   | 472.3   | 2.5       |
| 80°-90°   | 129.5   | 0.7       |
| 90°-100°  | 195.7   | 1.0       |
| 100°-110° | 621.8   | 3.3       |
| 110°-120° | 1064.1  | 5.6       |
| 120°-130° | 1399.5  | 7.3       |
| 130°-140° | 1570.9  | 8.2       |
| 140°-150° | 1540.4  | 8.1       |
| 150°-160° | 1292.2  | 6.8       |
| 160°-170° | 856.9   | 4.5       |
| 170°-180° | 299.5   | 1.6       |
| 0°-30°    | 3532.3  | 18.5      |
| 0°-40°    | 5485.2  | 28.8      |
| 0°-60°    | 8689.6  | 45.6      |
| 0°-90°    | 10209.0 | 53.6      |
| 90°-120°  | 1881.6  | 9.9       |
| 90°-150°  | 6392.4  | 33.6      |
| 90°-180°  | 8841.0  | 46.4      |
| 0°-180°   | 19050.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 4960 | 4960  | 4960 | 4960  | 4960 |      |
| 5°   | 4960 | 4937  | 4879 | 4919  | 4906 | 470  |
| 15°  | 4717 | 4668  | 4515 | 4430  | 4385 | 1329 |
| 25°  | 4282 | 4138  | 3842 | 3658  | 3590 | 1969 |
| 35°  | 3690 | 3460  | 3066 | 2783  | 2684 | 2309 |
| 45°  | 3016 | 2715  | 2244 | 1925  | 1818 | 2329 |
| 55°  | 2293 | 1943  | 1459 | 1190  | 1104 | 2049 |
| 65°  | 1549 | 1185  | 781  | 629   | 615  | 1535 |
| 75°  | 826  | 511   | 359  | 328   | 323  | 873  |
| 85°  | 193  | 99    | 85   | 85    | 85   | 221  |
| 90°  | 3    | 34    | 93   | 88    | 91   | 19   |
| 95°  | 139  | 166   | 171  | 171   | 166  | 155  |
| 105° | 574  | 582   | 587  | 592   | 592  | 606  |
| 115° | 1068 | 1083  | 1078 | 1076  | 1068 | 1056 |
| 125° | 1553 | 1577  | 1569 | 1561  | 1558 | 1388 |
| 135° | 2009 | 2038  | 2044 | 2041  | 2034 | 1553 |
| 145° | 2439 | 2458  | 2473 | 2476  | 2466 | 1524 |
| 155° | 2789 | 2796  | 2805 | 2818  | 2810 | 1284 |
| 165° | 3034 | 3031  | 3031 | 3050  | 3037 | 856  |
| 175° | 3157 | 3149  | 3144 | 3163  | 3146 | 300  |
| 180° | 3163 | 3163  | 3163 | 3163  | 3163 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 4959.6 | 4959.6 | 4959.6 | 4959.6 | 4959.6 |
| 2.5°   | 4982.0 | 4959.6 | 4910.1 | 4955.3 | 4946.2 |
| 5°     | 4959.6 | 4937.2 | 4878.6 | 4919.1 | 4905.8 |
| 7.5°   | 4919.1 | 4892.4 | 4829.6 | 4847.2 | 4824.8 |
| 10°    | 4865.3 | 4833.9 | 4744.3 | 4730.5 | 4703.9 |
| 12.5°  | 4798.1 | 4757.7 | 4636.2 | 4609.6 | 4560.1 |
| 15°    | 4717.2 | 4667.7 | 4515.3 | 4430.0 | 4385.3 |
| 17.5°  | 4622.9 | 4551.0 | 4362.4 | 4263.9 | 4192.0 |
| 20°    | 4515.3 | 4425.3 | 4201.0 | 4089.1 | 3990.0 |
| 22.5°  | 4398.6 | 4295.3 | 4034.8 | 3882.4 | 3815.3 |
| 25°    | 4282.0 | 4138.1 | 3841.9 | 3658.1 | 3590.5 |
| 27.5°  | 4142.9 | 3990.0 | 3662.4 | 3451.5 | 3348.1 |
| 30°    | 3994.8 | 3823.9 | 3464.8 | 3236.2 | 3114.8 |
| 32.5°  | 3851.0 | 3644.3 | 3276.7 | 3007.2 | 2894.8 |
| 35°    | 3689.6 | 3460.5 | 3065.7 | 2782.9 | 2683.8 |
| 37.5°  | 3532.4 | 3285.3 | 2868.1 | 2558.1 | 2446.2 |
| 40°    | 3366.2 | 3097.2 | 2661.5 | 2342.9 | 2226.2 |
| 42.5°  | 3195.7 | 2908.6 | 2455.3 | 2122.9 | 2011.0 |
| 45°    | 3016.2 | 2715.3 | 2244.3 | 1925.3 | 1817.6 |
| 47.5°  | 2845.7 | 2527.2 | 2042.4 | 1723.4 | 1624.8 |
| 50°    | 2657.2 | 2338.6 | 1844.8 | 1534.8 | 1441.0 |
| 52.5°  | 2472.9 | 2136.2 | 1656.2 | 1360.0 | 1274.8 |
| 55°    | 2293.4 | 1943.4 | 1458.6 | 1189.5 | 1104.3 |
| 57.5°  | 2109.5 | 1750.5 | 1283.8 | 1032.4 | 960.5  |
| 60°    | 1921.0 | 1561.9 | 1099.5 | 871.0  | 799.1  |
| 62.5°  | 1737.2 | 1378.1 | 942.4  | 727.2  | 691.4  |
| 65°    | 1548.6 | 1184.8 | 781.0  | 628.6  | 614.8  |
| 67.5°  | 1369.1 | 1005.2 | 628.6  | 551.9  | 538.6  |
| 70°    | 1180.5 | 830.5  | 520.5  | 475.7  | 457.6  |
| 72.5°  | 1001.0 | 668.6  | 435.2  | 399.5  | 390.5  |
| 75°    | 825.7  | 511.4  | 359.1  | 327.6  | 323.3  |
| 77.5°  | 651.0  | 363.3  | 282.9  | 264.8  | 255.7  |
| 80°    | 489.1  | 260.5  | 215.2  | 197.6  | 197.6  |
| 82.5°  | 341.0  | 175.2  | 148.1  | 139.0  | 139.0  |
| 85°    | 192.9  | 98.6   | 85.2   | 85.2   | 85.2   |
| 87.5°  | 71.9   | 35.7   | 35.7   | 31.4   | 31.4   |
| 90°    | 2.9    | 34.3   | 93.4   | 87.7   | 90.6   |
| 92.5°  | 59.1   | 80.1   | 83.0   | 85.8   | 85.8   |
| 95°    | 139.2  | 165.9  | 170.7  | 170.7  | 165.9  |
| 97.5°  | 231.7  | 256.5  | 267.0  | 267.0  | 267.0  |
| 100°   | 338.5  | 360.4  | 368.0  | 368.0  | 365.2  |
| 102.5° | 451.0  | 467.2  | 477.7  | 480.5  | 477.7  |
| 105°   | 574.0  | 581.6  | 587.3  | 592.1  | 592.1  |
| 107.5° | 696.0  | 707.5  | 707.5  | 709.4  | 696.0  |
| 110°   | 814.3  | 829.5  | 829.5  | 829.5  | 821.9  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 942.0  | 958.2  | 955.4  | 947.7  | 942.0  |
| 115°   | 1067.9 | 1083.1 | 1078.4 | 1075.5 | 1067.9 |
| 117.5° | 1192.8 | 1213.8 | 1200.4 | 1192.8 | 1185.1 |
| 120°   | 1318.6 | 1339.6 | 1318.6 | 1318.6 | 1310.1 |
| 122.5° | 1433.0 | 1459.7 | 1446.4 | 1438.8 | 1433.0 |
| 125°   | 1553.2 | 1577.0 | 1569.4 | 1560.8 | 1558.0 |
| 127.5° | 1670.5 | 1700.0 | 1689.5 | 1678.1 | 1670.5 |
| 130°   | 1780.1 | 1814.4 | 1809.7 | 1803.9 | 1793.5 |
| 132.5° | 1903.1 | 1929.8 | 1931.7 | 1918.4 | 1910.7 |
| 135°   | 2008.9 | 2038.5 | 2044.2 | 2041.4 | 2033.7 |
| 137.5° | 2127.2 | 2151.0 | 2155.8 | 2153.9 | 2142.4 |
| 140°   | 2231.1 | 2254.9 | 2268.3 | 2268.3 | 2257.8 |
| 142.5° | 2337.9 | 2361.7 | 2369.3 | 2372.2 | 2361.7 |
| 145°   | 2438.9 | 2458.0 | 2473.3 | 2476.1 | 2465.6 |
| 147.5° | 2529.5 | 2553.4 | 2564.8 | 2569.6 | 2559.1 |
| 150°   | 2623.0 | 2639.2 | 2649.7 | 2658.2 | 2649.7 |
| 152.5° | 2705.9 | 2722.1 | 2735.5 | 2746.0 | 2735.5 |
| 155°   | 2788.9 | 2796.5 | 2805.1 | 2818.4 | 2809.8 |
| 157.5° | 2860.4 | 2866.1 | 2870.9 | 2889.9 | 2876.6 |
| 160°   | 2924.3 | 2930.0 | 2932.8 | 2949.0 | 2937.6 |
| 162.5° | 2983.4 | 2983.4 | 2986.2 | 3004.3 | 2991.0 |
| 165°   | 3033.9 | 3031.0 | 3031.0 | 3050.1 | 3036.8 |
| 167.5° | 3079.7 | 3071.1 | 3071.1 | 3090.2 | 3076.8 |
| 170°   | 3114.0 | 3106.4 | 3103.5 | 3122.6 | 3106.4 |
| 172.5° | 3137.8 | 3130.2 | 3127.3 | 3146.4 | 3130.2 |
| 175°   | 3156.9 | 3149.3 | 3143.6 | 3162.6 | 3146.4 |
| 177.5° | 3167.4 | 3159.8 | 3154.0 | 3170.2 | 3154.0 |
| 180°   | 3162.6 | 3162.6 | 3162.6 | 3162.6 | 3162.6 |

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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 | 11.82            | 12.68 | 12.75 | 13.63 | 14.85 | 7.78           | 8.64  | 8.71  | 9.59  | 10.81 |
|                 | 3H   | 13.50            | 14.27 | 14.45 | 15.23 | 16.47 | 8.97           | 9.74  | 9.92  | 10.70 | 11.94 |
|                 | 4H   | 14.12            | 14.84 | 15.08 | 15.80 | 17.06 | 9.42           | 10.15 | 10.38 | 11.11 | 12.37 |
|                 | 6H   | 14.54            | 15.21 | 15.51 | 16.18 | 17.45 | 9.75           | 10.42 | 10.72 | 11.38 | 12.65 |
|                 | 8H   | 14.67            | 15.31 | 15.65 | 16.29 | 17.56 | 9.84           | 10.48 | 10.82 | 11.46 | 12.72 |
|                 | 12H  | 14.74            | 15.34 | 15.72 | 16.32 | 17.61 | 9.88           | 10.49 | 10.87 | 11.46 | 12.75 |
| 4H              | 2H   | 11.84            | 12.57 | 12.81 | 13.53 | 14.78 | 8.38           | 9.11  | 9.35  | 10.07 | 11.32 |
|                 | 3H   | 13.68            | 14.28 | 14.65 | 15.27 | 16.54 | 9.74           | 10.34 | 10.71 | 11.33 | 12.60 |
|                 | 4H   | 14.38            | 14.93 | 15.36 | 15.91 | 17.20 | 10.29          | 10.84 | 11.27 | 11.82 | 13.11 |
|                 | 6H   | 14.90            | 15.37 | 15.89 | 16.38 | 17.67 | 10.71          | 11.18 | 11.70 | 12.19 | 13.48 |
|                 | 8H   | 15.08            | 15.52 | 16.07 | 16.52 | 17.82 | 10.84          | 11.28 | 11.83 | 12.28 | 13.58 |
|                 | 12H  | 15.17            | 15.57 | 16.19 | 16.59 | 17.90 | 10.90          | 11.30 | 11.92 | 12.32 | 13.63 |
| 8H              | 4H   | 14.35            | 14.79 | 15.34 | 15.79 | 17.09 | 10.57          | 11.01 | 11.57 | 12.01 | 13.32 |
|                 | 6H   | 14.92            | 15.28 | 15.94 | 16.32 | 17.63 | 11.09          | 11.46 | 12.11 | 12.50 | 13.80 |
|                 | 8H   | 15.14            | 15.46 | 16.17 | 16.49 | 17.81 | 11.28          | 11.61 | 12.31 | 12.63 | 13.96 |
|                 | 12H  | 15.28            | 15.56 | 16.31 | 16.59 | 17.95 | 11.40          | 11.69 | 12.44 | 12.71 | 14.08 |
| 12H             | 4H   | 14.30            | 14.70 | 15.31 | 15.71 | 17.02 | 10.58          | 10.98 | 11.59 | 11.99 | 13.30 |
|                 | 6H   | 14.89            | 15.22 | 15.92 | 16.24 | 17.57 | 11.14          | 11.46 | 12.17 | 12.49 | 13.81 |
|                 | 8H   | 15.12            | 15.40 | 16.15 | 16.42 | 17.79 | 11.36          | 11.64 | 12.39 | 12.66 | 14.03 |