

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: P903419

Luminaire Tested: DFN2DIP-PN4F0-110D090US830-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P903419  
REPORT IS A COMBINATION OF REPORTS P901234 AND P898053  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN4F0-110D090US830-RLLONL  
Description: 4 foot, Pentagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

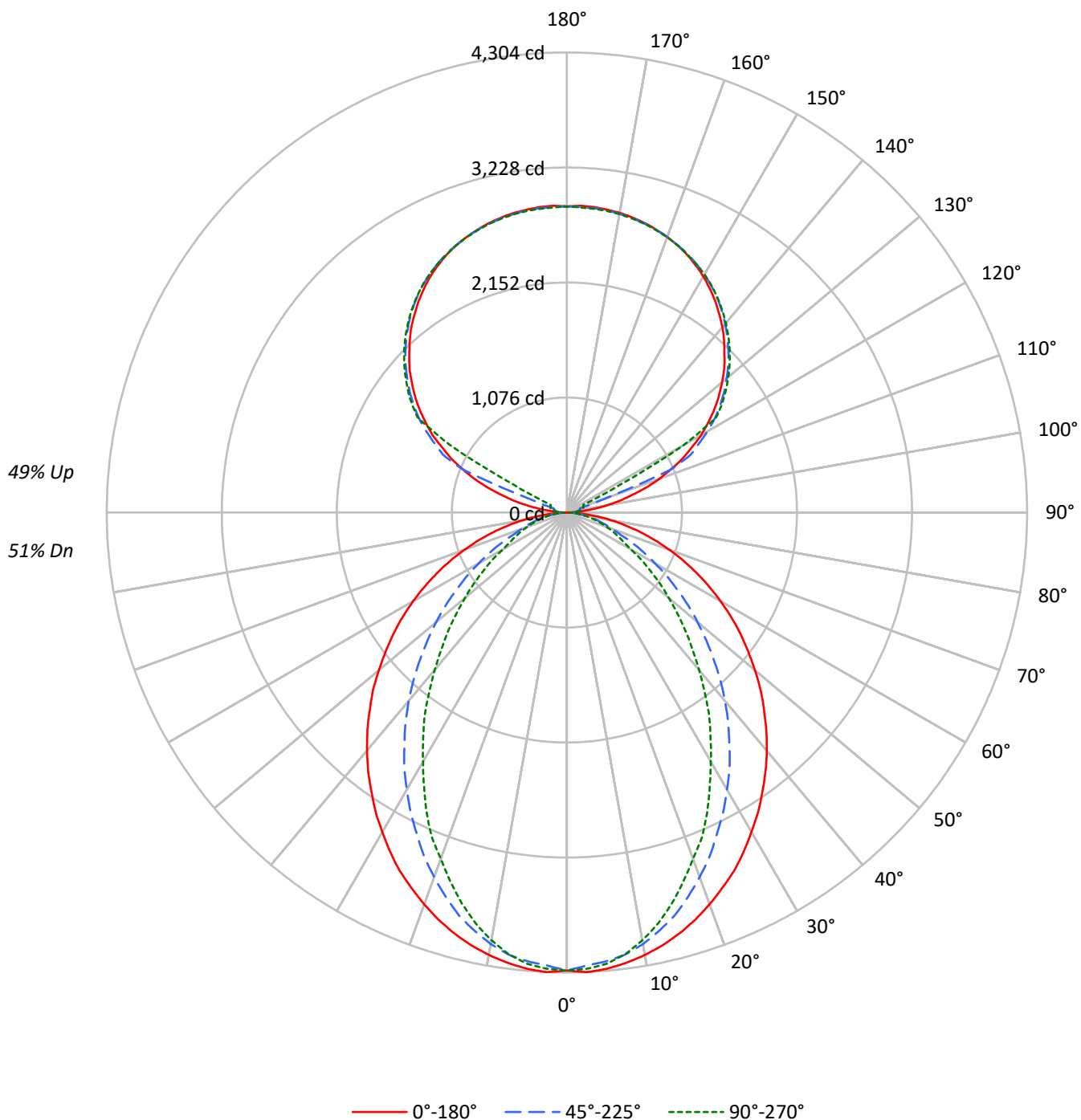
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 17210.8 lumens  
Efficiency: N/A  
Efficacy: 95.1 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.74' x L: 3.94' x H: 0.1')  
CIE Type: General Diffuse  
  
Input Watts (W): 180.9  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.996  
Total Harmonic Distortion (THDi): 0.064  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

TEST NUMBER: P903419

CATALOG NUMBER: DFN2DIP-PN4F0-110D090US830-RLLONL

### Luminous Intensity Polar Plot



TEST NUMBER: P903419

CATALOG NUMBER: DFN2DIP-PN4F0-110D090US830-RLLONL

**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   | 107 | 107 | 107 | 107 | 99 | 99 | 99 | 99 | 84 | 84 | 84 | 70 | 70 | 70 | 57 | 57 | 57 |
| 1   | 99  | 94  | 91  | 87  | 91 | 87 | 84 | 81 | 74 | 72 | 70 | 62 | 61 | 59 | 51 | 50 | 49 |
| 2   | 90  | 83  | 77  | 72  | 83 | 77 | 72 | 68 | 66 | 62 | 59 | 55 | 53 | 50 | 46 | 44 | 42 |
| 3   | 83  | 73  | 66  | 61  | 76 | 68 | 62 | 57 | 58 | 54 | 50 | 49 | 46 | 43 | 41 | 39 | 37 |
| 4   | 76  | 65  | 58  | 52  | 70 | 61 | 54 | 49 | 52 | 47 | 43 | 44 | 41 | 37 | 37 | 34 | 32 |
| 5   | 70  | 58  | 51  | 45  | 64 | 54 | 48 | 42 | 47 | 42 | 37 | 40 | 36 | 33 | 34 | 31 | 28 |
| 6   | 64  | 53  | 45  | 39  | 59 | 49 | 42 | 37 | 43 | 37 | 33 | 36 | 32 | 29 | 31 | 27 | 25 |
| 7   | 60  | 48  | 40  | 34  | 55 | 45 | 38 | 33 | 39 | 33 | 29 | 33 | 29 | 26 | 28 | 25 | 22 |
| 8   | 55  | 43  | 36  | 31  | 51 | 41 | 34 | 29 | 35 | 30 | 26 | 31 | 26 | 23 | 26 | 23 | 20 |
| 9   | 52  | 40  | 32  | 27  | 48 | 37 | 31 | 26 | 33 | 27 | 24 | 28 | 24 | 21 | 24 | 21 | 18 |
| 10  | 48  | 37  | 29  | 25  | 45 | 34 | 28 | 24 | 30 | 25 | 21 | 26 | 22 | 19 | 22 | 19 | 17 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3128 | 3128 | 3128 |
| 5°  | 3133 | 3079 | 3099 |
| 10° | 3102 | 3019 | 2998 |
| 15° | 3059 | 2919 | 2843 |
| 20° | 3003 | 2782 | 2652 |
| 25° | 2945 | 2628 | 2468 |
| 30° | 2867 | 2471 | 2234 |
| 35° | 2791 | 2301 | 2028 |
| 40° | 2714 | 2125 | 1793 |
| 45° | 2624 | 1931 | 1579 |
| 50° | 2531 | 1734 | 1370 |
| 55° | 2433 | 1524 | 1170 |
| 60° | 2321 | 1304 | 963  |
| 65° | 2192 | 1080 | 868  |
| 70° | 2035 | 872  | 786  |
| 75° | 1838 | 769  | 717  |
| 80° | 1552 | 647  | 624  |
| 85° | 1081 | 434  | 472  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2624 cd/sqm

TEST NUMBER: P903419

CATALOG NUMBER: DFN2DIP-PN4F0-110D090US830-RLLONL

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 401.6   | 2.3       |
| 10°-20°   | 1102.5  | 6.4       |
| 20°-30°   | 1547.8  | 9.0       |
| 30°-40°   | 1687.2  | 9.8       |
| 40°-50°   | 1550.8  | 9.0       |
| 50°-60°   | 1217.9  | 7.1       |
| 60°-70°   | 792.7   | 4.6       |
| 70°-80°   | 408.1   | 2.4       |
| 80°-90°   | 109.2   | 0.6       |
| 90°-100°  | 94.4    | 0.5       |
| 100°-110° | 351.9   | 2.0       |
| 110°-120° | 933.3   | 5.4       |
| 120°-130° | 1548.0  | 9.0       |
| 130°-140° | 1644.3  | 9.6       |
| 140°-150° | 1528.2  | 8.9       |
| 150°-160° | 1228.6  | 7.1       |
| 160°-170° | 791.7   | 4.6       |
| 170°-180° | 272.5   | 1.6       |
| 0°-30°    | 3051.9  | 17.7      |
| 0°-40°    | 4739.1  | 27.5      |
| 0°-60°    | 7507.8  | 43.6      |
| 0°-90°    | 8817.8  | 51.2      |
| 90°-120°  | 1379.6  | 8.0       |
| 90°-150°  | 6100.2  | 35.4      |
| 90°-180°  | 8393.0  | 48.8      |
| 0°-180°   | 17210.8 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 4285 | 4285  | 4285 | 4285  | 4285 |      |
| 5°   | 4285 | 4266  | 4215 | 4250  | 4239 | 406  |
| 15°  | 4076 | 4033  | 3901 | 3828  | 3789 | 1148 |
| 25°  | 3700 | 3575  | 3319 | 3161  | 3102 | 1701 |
| 35°  | 3188 | 2990  | 2649 | 2404  | 2319 | 1995 |
| 45°  | 2606 | 2346  | 1939 | 1663  | 1570 | 2013 |
| 55°  | 1981 | 1679  | 1260 | 1028  | 954  | 1771 |
| 65°  | 1338 | 1024  | 675  | 543   | 531  | 1326 |
| 75°  | 713  | 442   | 310  | 283   | 279  | 755  |
| 85°  | 167  | 85    | 74   | 74    | 74   | 191  |
| 90°  | 2    | 25    | 41   | 52    | 56   | 16   |
| 95°  | 135  | 66    | 81   | 91    | 89   | 159  |
| 105° | 630  | 692   | 126  | 149   | 157  | 673  |
| 115° | 1191 | 1226  | 1278 | 319   | 170  | 1173 |
| 125° | 1684 | 1711  | 1750 | 1765  | 1771 | 1502 |
| 135° | 2084 | 2117  | 2136 | 2157  | 2152 | 1610 |
| 145° | 2418 | 2415  | 2451 | 2465  | 2455 | 1512 |
| 155° | 2662 | 2644  | 2668 | 2681  | 2664 | 1227 |
| 165° | 2805 | 2792  | 2799 | 2813  | 2799 | 792  |
| 175° | 2869 | 2854  | 2859 | 2873  | 2852 | 273  |
| 180° | 2863 | 2863  | 2863 | 2863  | 2863 |      |

TEST NUMBER: P903419

CATALOG NUMBER: DFN2DIP-PN4F0-110D090US830-RLLONL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 4285.1 | 4285.1 | 4285.1 | 4285.1 | 4285.1 |
| 2.5°   | 4304.4 | 4285.1 | 4242.3 | 4281.4 | 4273.6 |
| 5°     | 4285.1 | 4265.8 | 4215.1 | 4250.1 | 4238.6 |
| 7.5°   | 4250.1 | 4227.0 | 4172.7 | 4188.0 | 4168.6 |
| 10°    | 4203.6 | 4176.4 | 4099.1 | 4087.1 | 4064.1 |
| 12.5°  | 4145.6 | 4110.6 | 4005.7 | 3982.6 | 3939.8 |
| 15°    | 4075.6 | 4032.9 | 3901.2 | 3827.6 | 3788.8 |
| 17.5°  | 3994.2 | 3932.1 | 3769.1 | 3683.9 | 3621.8 |
| 20°    | 3901.2 | 3823.4 | 3629.6 | 3532.9 | 3447.3 |
| 22.5°  | 3800.4 | 3711.1 | 3486.1 | 3354.4 | 3296.4 |
| 25°    | 3699.6 | 3575.3 | 3319.4 | 3160.6 | 3102.2 |
| 27.5°  | 3579.5 | 3447.3 | 3164.3 | 2982.0 | 2892.8 |
| 30°    | 3451.5 | 3303.8 | 2993.6 | 2796.1 | 2691.1 |
| 32.5°  | 3327.3 | 3148.7 | 2831.0 | 2598.2 | 2501.1 |
| 35°    | 3187.8 | 2989.8 | 2648.8 | 2404.4 | 2318.8 |
| 37.5°  | 3052.0 | 2838.5 | 2478.0 | 2210.2 | 2113.6 |
| 40°    | 2908.4 | 2676.0 | 2299.5 | 2024.2 | 1923.4 |
| 42.5°  | 2761.1 | 2513.0 | 2121.4 | 1834.2 | 1737.5 |
| 45°    | 2606.0 | 2346.0 | 1939.1 | 1663.4 | 1570.5 |
| 47.5°  | 2458.7 | 2183.5 | 1764.6 | 1488.9 | 1403.8 |
| 50°    | 2295.8 | 2020.5 | 1593.9 | 1326.1 | 1245.0 |
| 52.5°  | 2136.6 | 1845.7 | 1431.0 | 1175.1 | 1101.4 |
| 55°    | 1981.4 | 1679.0 | 1260.2 | 1027.7 | 954.1  |
| 57.5°  | 1822.7 | 1512.4 | 1109.2 | 892.0  | 829.8  |
| 60°    | 1659.7 | 1349.5 | 950.0  | 752.5  | 690.4  |
| 62.5°  | 1500.9 | 1190.7 | 814.3  | 628.3  | 597.4  |
| 65°    | 1337.9 | 1023.6 | 674.8  | 543.1  | 531.1  |
| 67.5°  | 1182.9 | 868.6  | 543.1  | 476.8  | 465.3  |
| 70°    | 1019.9 | 717.6  | 449.7  | 411.0  | 395.4  |
| 72.5°  | 864.8  | 577.7  | 376.1  | 345.2  | 337.3  |
| 75°    | 713.4  | 441.9  | 310.2  | 283.0  | 279.4  |
| 77.5°  | 562.4  | 314.0  | 244.4  | 228.8  | 220.9  |
| 80°    | 422.5  | 225.1  | 186.0  | 170.8  | 170.8  |
| 82.5°  | 294.5  | 151.4  | 128.0  | 120.2  | 120.2  |
| 85°    | 166.6  | 85.2   | 73.6   | 73.6   | 73.6   |
| 87.5°  | 62.1   | 30.8   | 30.8   | 27.1   | 27.1   |
| 90°    | 2.0    | 24.9   | 41.3   | 51.9   | 55.8   |
| 92.5°  | 51.9   | 43.5   | 49.7   | 53.9   | 55.8   |
| 95°    | 134.6  | 66.2   | 80.7   | 91.2   | 89.1   |
| 97.5°  | 242.3  | 72.6   | 105.6  | 111.9  | 113.9  |
| 100°   | 366.7  | 82.9   | 118.1  | 134.6  | 138.7  |
| 102.5° | 503.3  | 499.4  | 122.2  | 144.9  | 151.3  |
| 105°   | 629.7  | 692.0  | 126.4  | 149.1  | 157.4  |
| 107.5° | 776.8  | 828.5  | 130.6  | 153.3  | 161.6  |
| 110°   | 917.8  | 961.1  | 362.6  | 155.4  | 163.6  |

TEST NUMBER: P903419

CATALOG NUMBER: DFN2DIP-PN4F0-110D090US830-RLLONL

**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1050.4 | 1087.5 | 1052.3 | 159.4  | 165.8  |
| 115°   | 1191.1 | 1226.2 | 1278.2 | 319.1  | 169.9  |
| 117.5° | 1313.3 | 1354.7 | 1390.1 | 1093.7 | 551.0  |
| 120°   | 1450.1 | 1481.1 | 1518.5 | 1543.3 | 1263.7 |
| 122.5° | 1566.0 | 1599.2 | 1640.8 | 1653.0 | 1655.3 |
| 125°   | 1684.0 | 1711.1 | 1750.5 | 1765.0 | 1771.1 |
| 127.5° | 1791.8 | 1820.8 | 1852.1 | 1872.7 | 1874.7 |
| 130°   | 1893.4 | 1926.7 | 1949.3 | 1972.1 | 1970.2 |
| 132.5° | 1997.0 | 2024.0 | 2046.6 | 2065.4 | 2063.4 |
| 135°   | 2084.1 | 2117.2 | 2135.7 | 2156.6 | 2152.5 |
| 137.5° | 2175.1 | 2199.9 | 2220.8 | 2241.5 | 2235.3 |
| 140°   | 2264.1 | 2280.9 | 2303.5 | 2322.1 | 2311.9 |
| 142.5° | 2338.9 | 2353.4 | 2380.2 | 2396.7 | 2386.4 |
| 145°   | 2417.6 | 2415.4 | 2450.6 | 2465.1 | 2454.8 |
| 147.5° | 2485.8 | 2479.6 | 2514.8 | 2525.2 | 2517.0 |
| 150°   | 2552.2 | 2537.7 | 2570.9 | 2583.1 | 2572.9 |
| 152.5° | 2608.0 | 2591.5 | 2622.5 | 2635.1 | 2620.6 |
| 155°   | 2661.9 | 2643.5 | 2668.2 | 2680.6 | 2664.1 |
| 157.5° | 2705.5 | 2689.0 | 2707.6 | 2722.2 | 2705.5 |
| 160°   | 2742.8 | 2730.3 | 2742.8 | 2755.1 | 2740.6 |
| 162.5° | 2775.8 | 2763.4 | 2773.8 | 2788.3 | 2769.7 |
| 165°   | 2804.8 | 2792.5 | 2798.7 | 2813.2 | 2798.7 |
| 167.5° | 2827.7 | 2815.2 | 2821.5 | 2836.0 | 2817.4 |
| 170°   | 2846.4 | 2833.8 | 2838.0 | 2852.5 | 2833.8 |
| 172.5° | 2858.7 | 2846.4 | 2850.5 | 2865.0 | 2846.4 |
| 175°   | 2869.0 | 2854.5 | 2858.7 | 2873.2 | 2852.5 |
| 177.5° | 2873.2 | 2858.7 | 2860.9 | 2875.4 | 2856.8 |
| 180°   | 2862.9 | 2862.9 | 2862.9 | 2862.9 | 2862.9 |

TEST NUMBER: P903419

CATALOG NUMBER: DFN2DIP-PN4F0-110D090US830-RLONL

**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 | 11.23            | 12.07 | 12.18 | 13.04 | 14.29 | 7.20           | 8.04  | 8.15  | 9.00  | 10.26 |
|                 | 3H   | 12.91            | 13.66 | 13.88 | 14.64 | 15.92 | 8.39           | 9.14  | 9.35  | 10.11 | 11.39 |
|                 | 4H   | 13.52            | 14.23 | 14.50 | 15.21 | 16.50 | 8.84           | 9.55  | 9.82  | 10.53 | 11.81 |
|                 | 6H   | 13.95            | 14.60 | 14.94 | 15.58 | 16.88 | 9.16           | 9.81  | 10.15 | 10.80 | 12.10 |
|                 | 8H   | 14.08            | 14.70 | 15.07 | 15.70 | 16.99 | 9.25           | 9.87  | 10.25 | 10.87 | 12.17 |
|                 | 12H  | 14.14            | 14.73 | 15.14 | 15.72 | 17.04 | 9.30           | 9.89  | 10.30 | 10.88 | 12.20 |
| 4H              | 2H   | 11.25            | 11.96 | 12.24 | 12.94 | 14.23 | 7.79           | 8.50  | 8.78  | 9.48  | 10.77 |
|                 | 3H   | 13.08            | 13.67 | 14.08 | 14.68 | 15.98 | 9.15           | 9.74  | 10.14 | 10.74 | 12.04 |
|                 | 4H   | 13.78            | 14.32 | 14.78 | 15.32 | 16.64 | 9.70           | 10.23 | 10.70 | 11.23 | 12.56 |
|                 | 6H   | 14.30            | 14.76 | 15.31 | 15.78 | 17.11 | 10.12          | 10.58 | 11.13 | 11.60 | 12.93 |
|                 | 8H   | 14.47            | 14.91 | 15.49 | 15.92 | 17.26 | 10.25          | 10.68 | 11.26 | 11.70 | 13.03 |
|                 | 12H  | 14.57            | 14.96 | 15.60 | 15.99 | 17.34 | 10.31          | 10.70 | 11.34 | 11.73 | 13.08 |
| 8H              | 4H   | 13.75            | 14.18 | 14.76 | 15.20 | 16.53 | 9.98           | 10.41 | 10.99 | 11.43 | 12.76 |
|                 | 6H   | 14.32            | 14.67 | 15.36 | 15.73 | 17.07 | 10.50          | 10.86 | 11.54 | 11.91 | 13.25 |
|                 | 8H   | 14.54            | 14.85 | 15.58 | 15.89 | 17.25 | 10.69          | 11.00 | 11.74 | 12.05 | 13.40 |
|                 | 12H  | 14.68            | 14.95 | 15.73 | 15.99 | 17.39 | 10.81          | 11.09 | 11.86 | 12.13 | 13.52 |
| 12H             | 4H   | 13.70            | 14.09 | 14.73 | 15.12 | 16.46 | 9.98           | 10.37 | 11.02 | 11.41 | 12.75 |
|                 | 6H   | 14.29            | 14.61 | 15.34 | 15.65 | 17.01 | 10.55          | 10.86 | 11.59 | 11.91 | 13.26 |
|                 | 8H   | 14.52            | 14.79 | 15.57 | 15.83 | 17.23 | 10.76          | 11.04 | 11.81 | 12.08 | 13.47 |