

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: P927374

Luminaire Tested: DFN2DIP-HX4F0-080D120US835-RLLONL

Issue Date: 12/12/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P927374  
REPORT IS A COMBINATION OF REPORTS P900972 AND P896187  
Test Lab: INNOVATION CENTER  
Issue Date: 12/12/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX4F0-080D120US835-RLLONL  
Description: 4 foot, Hexagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

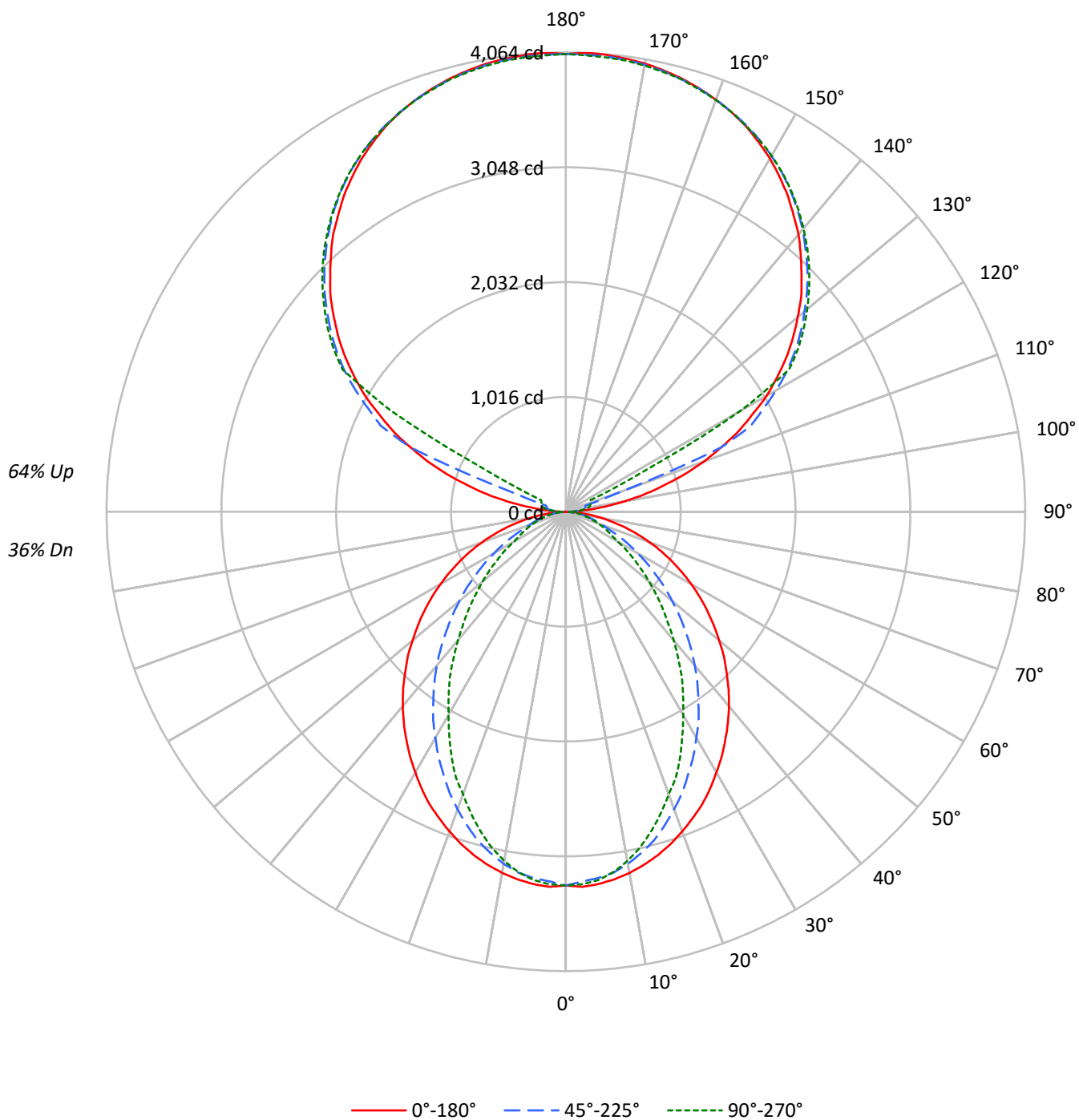
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 18680.0 lumens  
Efficiency: N/A  
Efficacy: 108.2 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): 172.6  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9613  
Total Harmonic Distortion (THDi): 0.083  
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°  | 2459 | 2459 | 2459 |
| 5°  | 2463 | 2420 | 2435 |
| 10° | 2438 | 2373 | 2356 |
| 15° | 2405 | 2294 | 2234 |
| 20° | 2361 | 2186 | 2083 |
| 25° | 2316 | 2065 | 1938 |
| 30° | 2255 | 1941 | 1754 |
| 35° | 2195 | 1808 | 1593 |
| 40° | 2135 | 1670 | 1407 |
| 45° | 2064 | 1517 | 1239 |
| 50° | 1991 | 1362 | 1075 |
| 55° | 1915 | 1197 | 917  |
| 60° | 1827 | 1024 | 755  |
| 65° | 1726 | 848  | 680  |
| 70° | 1603 | 684  | 616  |
| 75° | 1449 | 604  | 560  |
| 80° | 1226 | 507  | 486  |
| 85° | 857  | 340  | 366  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 2080 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 309.9   | 1.7       |
| 10°-20°   | 850.7   | 4.6       |
| 20°-30°   | 1194.3  | 6.4       |
| 30°-40°   | 1301.9  | 7.0       |
| 40°-50°   | 1196.6  | 6.4       |
| 50°-60°   | 939.7   | 5.0       |
| 60°-70°   | 611.7   | 3.3       |
| 70°-80°   | 314.9   | 1.7       |
| 80°-90°   | 87.5    | 0.5       |
| 90°-100°  | 133.5   | 0.7       |
| 100°-110° | 497.8   | 2.7       |
| 110°-120° | 1320.3  | 7.1       |
| 120°-130° | 2189.8  | 11.7      |
| 130°-140° | 2326.1  | 12.5      |
| 140°-150° | 2161.8  | 11.6      |
| 150°-160° | 1738.1  | 9.3       |
| 160°-170° | 1119.9  | 6.0       |
| 170°-180° | 385.5   | 2.1       |
| 0°-30°    | 2354.9  | 12.6      |
| 0°-40°    | 3656.8  | 19.6      |
| 0°-60°    | 5793.1  | 31.0      |
| 0°-90°    | 6807.1  | 36.4      |
| 90°-120°  | 1951.7  | 10.4      |
| 90°-150°  | 8629.4  | 46.2      |
| 90°-180°  | 11873.0 | 63.6      |
| 0°-180°   | 18680.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3306 | 3306  | 3306 | 3306  | 3306 |      |
| 5°   | 3306 | 3292  | 3252 | 3279  | 3270 | 314  |
| 15°  | 3145 | 3112  | 3010 | 2953  | 2924 | 886  |
| 25°  | 2855 | 2759  | 2561 | 2439  | 2394 | 1313 |
| 35°  | 2460 | 2307  | 2044 | 1855  | 1789 | 1540 |
| 45°  | 2011 | 1810  | 1496 | 1284  | 1212 | 1553 |
| 55°  | 1529 | 1296  | 972  | 793   | 736  | 1366 |
| 65°  | 1032 | 790   | 521  | 419   | 410  | 1024 |
| 75°  | 550  | 341   | 239  | 218   | 216  | 582  |
| 85°  | 129  | 66    | 57   | 57    | 57   | 148  |
| 90°  | 3    | 35    | 58   | 73    | 79   | 17   |
| 95°  | 190  | 94    | 114  | 129   | 126  | 225  |
| 105° | 891  | 979   | 179  | 211   | 223  | 952  |
| 115° | 1685 | 1735  | 1808 | 451   | 240  | 1659 |
| 125° | 2382 | 2421  | 2476 | 2497  | 2506 | 2125 |
| 135° | 2948 | 2995  | 3021 | 3051  | 3045 | 2277 |
| 145° | 3420 | 3417  | 3467 | 3487  | 3472 | 2139 |
| 155° | 3766 | 3739  | 3775 | 3792  | 3769 | 1735 |
| 165° | 3968 | 3950  | 3959 | 3980  | 3959 | 1121 |
| 175° | 4058 | 4038  | 4044 | 4064  | 4035 | 386  |
| 180° | 4050 | 4050  | 4050 | 4050  | 4050 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3306.4 | 3306.4 | 3306.4 | 3306.4 | 3306.4 |
| 2.5°   | 3321.3 | 3306.4 | 3273.4 | 3303.5 | 3297.5 |
| 5°     | 3306.4 | 3291.5 | 3252.4 | 3279.4 | 3270.5 |
| 7.5°   | 3279.4 | 3261.6 | 3219.7 | 3231.5 | 3216.5 |
| 10°    | 3243.5 | 3222.6 | 3162.9 | 3153.7 | 3135.9 |
| 12.5°  | 3198.8 | 3171.8 | 3090.8 | 3073.0 | 3040.0 |
| 15°    | 3144.8 | 3111.8 | 3010.2 | 2953.4 | 2923.5 |
| 17.5°  | 3081.9 | 3034.0 | 2908.3 | 2842.6 | 2794.6 |
| 20°    | 3010.2 | 2950.2 | 2800.7 | 2726.1 | 2660.0 |
| 22.5°  | 2932.4 | 2863.5 | 2689.9 | 2588.3 | 2543.5 |
| 25°    | 2854.6 | 2758.8 | 2561.3 | 2438.8 | 2393.7 |
| 27.5°  | 2761.9 | 2660.0 | 2441.6 | 2301.0 | 2232.1 |
| 30°    | 2663.2 | 2549.2 | 2309.9 | 2157.5 | 2076.5 |
| 32.5°  | 2567.3 | 2429.6 | 2184.5 | 2004.8 | 1929.9 |
| 35°    | 2459.7 | 2307.0 | 2043.8 | 1855.3 | 1789.2 |
| 37.5°  | 2354.9 | 2190.2 | 1912.1 | 1705.4 | 1630.8 |
| 40°    | 2244.2 | 2064.8 | 1774.3 | 1561.9 | 1484.1 |
| 42.5°  | 2130.5 | 1939.1 | 1636.8 | 1415.3 | 1340.6 |
| 45°    | 2010.8 | 1810.2 | 1496.2 | 1283.5 | 1211.8 |
| 47.5°  | 1897.2 | 1684.8 | 1361.6 | 1148.9 | 1083.2 |
| 50°    | 1771.4 | 1559.1 | 1229.9 | 1023.2 | 960.6  |
| 52.5°  | 1648.6 | 1424.1 | 1104.1 | 906.7  | 849.9  |
| 55°    | 1528.9 | 1295.6 | 972.4  | 793.0  | 736.2  |
| 57.5°  | 1406.4 | 1167.0 | 855.9  | 688.3  | 640.3  |
| 60°    | 1280.6 | 1041.3 | 733.0  | 580.6  | 532.7  |
| 62.5°  | 1158.1 | 918.7  | 628.3  | 484.8  | 461.0  |
| 65°    | 1032.4 | 789.8  | 520.6  | 419.1  | 409.8  |
| 67.5°  | 912.7  | 670.2  | 419.1  | 367.9  | 359.1  |
| 70°    | 787.0  | 553.7  | 347.0  | 317.1  | 305.1  |
| 72.5°  | 667.3  | 445.7  | 290.2  | 266.4  | 260.3  |
| 75°    | 550.5  | 341.0  | 239.4  | 218.4  | 215.6  |
| 77.5°  | 434.0  | 242.2  | 188.6  | 176.5  | 170.5  |
| 80°    | 326.0  | 173.7  | 143.5  | 131.7  | 131.7  |
| 82.5°  | 227.3  | 116.8  | 98.7   | 92.7   | 92.7   |
| 85°    | 128.6  | 65.7   | 56.8   | 56.8   | 56.8   |
| 87.5°  | 47.9   | 23.8   | 23.8   | 21.0   | 21.0   |
| 90°    | 2.8    | 35.1   | 58.5   | 73.4   | 79.0   |
| 92.5°  | 73.4   | 61.6   | 70.3   | 76.2   | 79.0   |
| 95°    | 190.3  | 93.6   | 114.1  | 129.1  | 126.0  |
| 97.5°  | 342.8  | 102.7  | 149.3  | 158.3  | 161.1  |
| 100°   | 518.8  | 117.3  | 167.0  | 190.3  | 196.3  |
| 102.5° | 712.0  | 706.4  | 172.9  | 205.0  | 214.0  |
| 105°   | 890.8  | 978.9  | 178.9  | 210.9  | 222.7  |
| 107.5° | 1098.9 | 1172.0 | 184.8  | 216.8  | 228.6  |
| 110°   | 1298.3 | 1359.6 | 512.9  | 219.9  | 231.4  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1485.9 | 1538.4 | 1488.7 | 225.5  | 234.5  |
| 115°   | 1684.9 | 1734.7 | 1808.1 | 451.3  | 240.5  |
| 117.5° | 1857.9 | 1916.4 | 1966.5 | 1547.1 | 779.5  |
| 120°   | 2051.4 | 2095.2 | 2148.1 | 2183.3 | 1787.6 |
| 122.5° | 2215.3 | 2262.3 | 2321.1 | 2338.5 | 2341.6 |
| 125°   | 2382.3 | 2420.6 | 2476.3 | 2496.8 | 2505.5 |
| 127.5° | 2534.7 | 2575.8 | 2620.0 | 2649.2 | 2652.0 |
| 130°   | 2678.4 | 2725.4 | 2757.4 | 2789.8 | 2787.0 |
| 132.5° | 2824.9 | 2863.2 | 2895.2 | 2921.7 | 2918.9 |
| 135°   | 2948.1 | 2995.1 | 3021.2 | 3050.8 | 3044.9 |
| 137.5° | 3076.9 | 3112.0 | 3141.6 | 3170.8 | 3162.1 |
| 140°   | 3202.9 | 3226.5 | 3258.5 | 3285.0 | 3270.4 |
| 142.5° | 3308.6 | 3329.2 | 3367.1 | 3390.4 | 3375.8 |
| 145°   | 3420.0 | 3416.9 | 3466.6 | 3487.2 | 3472.5 |
| 147.5° | 3516.4 | 3507.7 | 3557.5 | 3572.1 | 3560.6 |
| 150°   | 3610.3 | 3589.8 | 3636.8 | 3654.2 | 3639.6 |
| 152.5° | 3689.3 | 3666.0 | 3709.9 | 3727.6 | 3707.1 |
| 155°   | 3765.5 | 3739.4 | 3774.6 | 3792.0 | 3768.7 |
| 157.5° | 3827.1 | 3803.8 | 3830.3 | 3850.8 | 3827.1 |
| 160°   | 3880.0 | 3862.3 | 3880.0 | 3897.4 | 3876.9 |
| 162.5° | 3926.7 | 3909.3 | 3923.9 | 3944.4 | 3918.0 |
| 165°   | 3967.7 | 3950.3 | 3959.0 | 3979.6 | 3959.0 |
| 167.5° | 4000.1 | 3982.3 | 3991.4 | 4011.9 | 3985.5 |
| 170°   | 4026.5 | 4008.8 | 4014.7 | 4035.2 | 4008.8 |
| 172.5° | 4043.9 | 4026.5 | 4032.5 | 4053.0 | 4026.5 |
| 175°   | 4058.5 | 4038.0 | 4043.9 | 4064.5 | 4035.2 |
| 177.5° | 4064.5 | 4043.9 | 4047.1 | 4067.6 | 4041.2 |
| 180°   | 4049.9 | 4049.9 | 4049.9 | 4049.9 | 4049.9 |

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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 | 8.86             | 9.59  | 9.93  | 10.66 | 12.11 | 4.83           | 5.56 | 5.90 | 6.63 | 8.09  |
|                 | 3H   | 10.53            | 11.18 | 11.61 | 12.26 | 13.73 | 6.01           | 6.67 | 7.09 | 7.74 | 9.22  |
|                 | 4H   | 11.13            | 11.75 | 12.23 | 12.83 | 14.31 | 6.46           | 7.08 | 7.55 | 8.16 | 9.64  |
|                 | 6H   | 11.55            | 12.12 | 12.65 | 13.20 | 14.69 | 6.78           | 7.35 | 7.88 | 8.43 | 9.92  |
|                 | 8H   | 11.68            | 12.22 | 12.78 | 13.31 | 14.80 | 6.87           | 7.41 | 7.97 | 8.51 | 9.99  |
|                 | 12H  | 11.73            | 12.25 | 12.84 | 13.34 | 14.85 | 6.91           | 7.42 | 8.02 | 8.51 | 10.02 |
| 4H              | 2H   | 8.86             | 9.48  | 9.96  | 10.56 | 12.04 | 5.42           | 6.03 | 6.51 | 7.11 | 8.59  |
|                 | 3H   | 10.69            | 11.20 | 11.79 | 12.31 | 13.80 | 6.76           | 7.27 | 7.86 | 8.38 | 9.87  |
|                 | 4H   | 11.38            | 11.85 | 12.48 | 12.94 | 14.46 | 7.30           | 7.78 | 8.41 | 8.87 | 10.38 |
|                 | 6H   | 11.89            | 12.29 | 13.00 | 13.41 | 14.91 | 7.72           | 8.12 | 8.84 | 9.24 | 10.75 |
|                 | 8H   | 12.06            | 12.44 | 13.18 | 13.55 | 15.07 | 7.85           | 8.22 | 8.96 | 9.34 | 10.86 |
|                 | 12H  | 12.15            | 12.49 | 13.28 | 13.62 | 15.14 | 7.91           | 8.25 | 9.04 | 9.37 | 10.90 |
| 8H              | 4H   | 11.34            | 11.71 | 12.45 | 12.82 | 14.35 | 7.58           | 7.95 | 8.69 | 9.07 | 10.59 |
|                 | 6H   | 11.90            | 12.21 | 13.04 | 13.36 | 14.88 | 8.09           | 8.41 | 9.23 | 9.56 | 11.08 |
|                 | 8H   | 12.12            | 12.39 | 13.26 | 13.52 | 15.06 | 8.29           | 8.56 | 9.43 | 9.69 | 11.23 |
|                 | 12H  | 12.25            | 12.49 | 13.40 | 13.62 | 15.20 | 8.40           | 8.64 | 9.55 | 9.77 | 11.35 |
| 12H             | 4H   | 11.28            | 11.62 | 12.42 | 12.75 | 14.27 | 7.58           | 7.92 | 8.71 | 9.04 | 10.57 |
|                 | 6H   | 11.87            | 12.15 | 13.02 | 13.28 | 14.82 | 8.14           | 8.42 | 9.29 | 9.55 | 11.09 |
|                 | 8H   | 12.09            | 12.33 | 13.24 | 13.46 | 15.04 | 8.35           | 8.59 | 9.50 | 9.72 | 11.29 |