

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: P927050

Luminaire Tested: DFN2DIP-HX4F0-080D120US830-RLLONL

Issue Date: 12/12/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P927050  
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-HX4F0-080D120US830-RLLONL  
Description: 4 foot, Hexagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

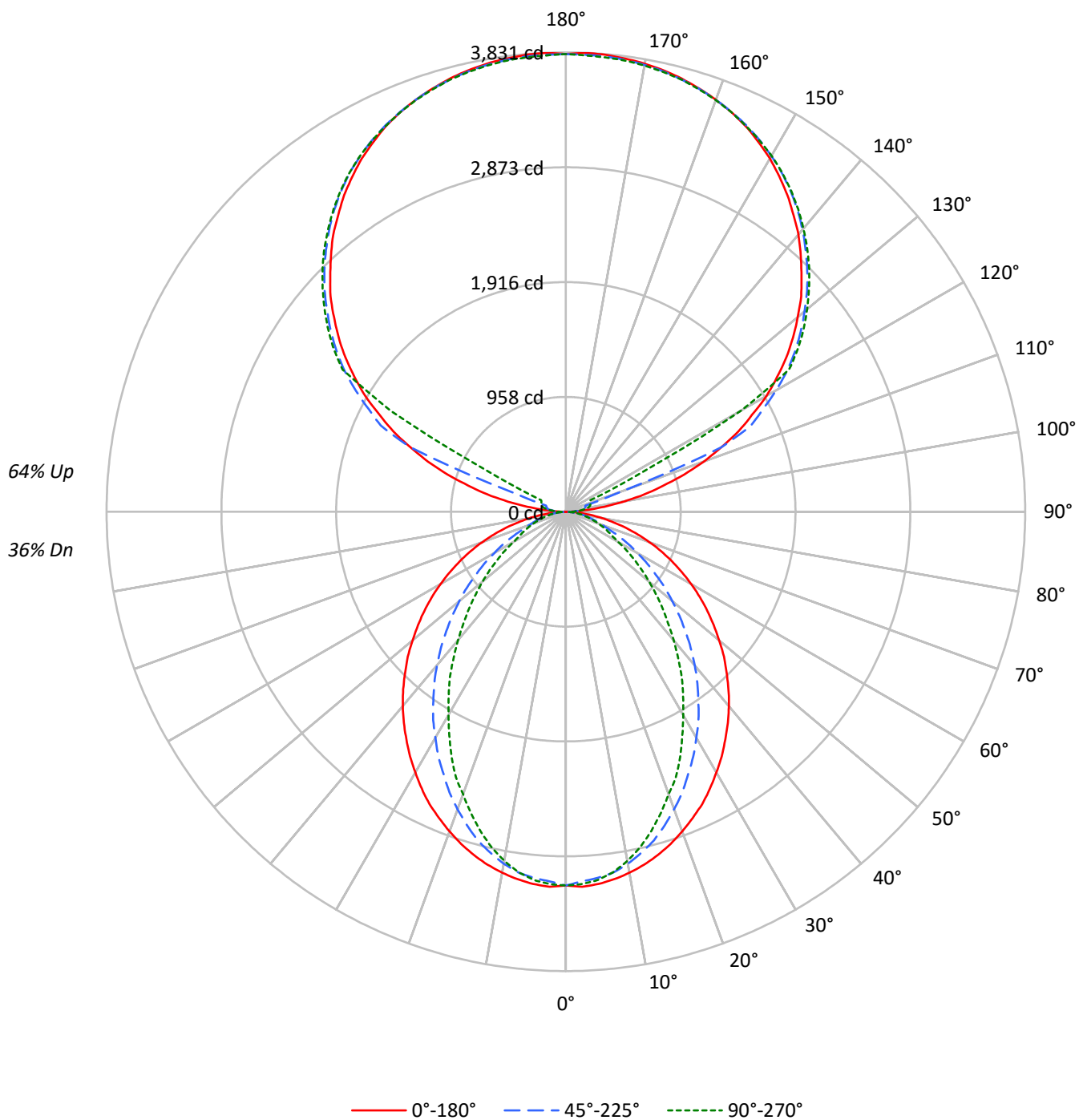
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 17605.9 lumens  
Efficiency: N/A  
Efficacy: 102.0 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°  | 2317 | 2317 | 2317 |
| 5°  | 2321 | 2281 | 2295 |
| 10° | 2298 | 2236 | 2221 |
| 15° | 2267 | 2162 | 2105 |
| 20° | 2225 | 2061 | 1964 |
| 25° | 2182 | 1947 | 1827 |
| 30° | 2125 | 1830 | 1653 |
| 35° | 2069 | 1704 | 1501 |
| 40° | 2012 | 1574 | 1326 |
| 45° | 1945 | 1430 | 1168 |
| 50° | 1877 | 1284 | 1013 |
| 55° | 1805 | 1128 | 865  |
| 60° | 1722 | 965  | 712  |
| 65° | 1627 | 799  | 641  |
| 70° | 1511 | 645  | 580  |
| 75° | 1366 | 569  | 528  |
| 80° | 1156 | 478  | 458  |
| 85° | 808  | 320  | 345  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 1961 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 292.1   | 1.7       |
| 10°-20°   | 801.8   | 4.6       |
| 20°-30°   | 1125.7  | 6.4       |
| 30°-40°   | 1227.0  | 7.0       |
| 40°-50°   | 1127.8  | 6.4       |
| 50°-60°   | 885.7   | 5.0       |
| 60°-70°   | 576.5   | 3.3       |
| 70°-80°   | 296.8   | 1.7       |
| 80°-90°   | 82.5    | 0.5       |
| 90°-100°  | 125.9   | 0.7       |
| 100°-110° | 469.2   | 2.7       |
| 110°-120° | 1244.4  | 7.1       |
| 120°-130° | 2063.9  | 11.7      |
| 130°-140° | 2192.3  | 12.5      |
| 140°-150° | 2037.5  | 11.6      |
| 150°-160° | 1638.1  | 9.3       |
| 160°-170° | 1055.6  | 6.0       |
| 170°-180° | 363.3   | 2.1       |
| 0°-30°    | 2219.5  | 12.6      |
| 0°-40°    | 3446.5  | 19.6      |
| 0°-60°    | 5460.0  | 31.0      |
| 0°-90°    | 6415.7  | 36.4      |
| 90°-120°  | 1839.4  | 10.4      |
| 90°-150°  | 8133.2  | 46.2      |
| 90°-180°  | 11190.0 | 63.6      |
| 0°-180°   | 17605.9 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3116 | 3116  | 3116 | 3116  | 3116 |      |
| 5°   | 3116 | 3102  | 3065 | 3091  | 3082 | 295  |
| 15°  | 2964 | 2933  | 2837 | 2784  | 2755 | 835  |
| 25°  | 2690 | 2600  | 2414 | 2299  | 2256 | 1237 |
| 35°  | 2318 | 2174  | 1926 | 1749  | 1686 | 1451 |
| 45°  | 1895 | 1706  | 1410 | 1210  | 1142 | 1464 |
| 55°  | 1441 | 1221  | 916  | 747   | 694  | 1288 |
| 65°  | 973  | 744   | 491  | 395   | 386  | 965  |
| 75°  | 519  | 321   | 226  | 206   | 203  | 549  |
| 85°  | 121  | 62    | 54   | 54    | 54   | 139  |
| 90°  | 3    | 33    | 55   | 69    | 74   | 16   |
| 95°  | 179  | 88    | 108  | 122   | 119  | 212  |
| 105° | 840  | 923   | 169  | 199   | 210  | 897  |
| 115° | 1588 | 1635  | 1704 | 425   | 227  | 1563 |
| 125° | 2245 | 2281  | 2334 | 2353  | 2361 | 2003 |
| 135° | 2779 | 2823  | 2848 | 2875  | 2870 | 2146 |
| 145° | 3223 | 3220  | 3267 | 3287  | 3273 | 2016 |
| 155° | 3549 | 3524  | 3558 | 3574  | 3552 | 1635 |
| 165° | 3740 | 3723  | 3731 | 3751  | 3731 | 1057 |
| 175° | 3825 | 3806  | 3811 | 3831  | 3803 | 364  |
| 180° | 3817 | 3817  | 3817 | 3817  | 3817 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3116.3 | 3116.3 | 3116.3 | 3116.3 | 3116.3 |
| 2.5°   | 3130.3 | 3116.3 | 3085.2 | 3113.5 | 3107.9 |
| 5°     | 3116.3 | 3102.2 | 3065.4 | 3090.8 | 3082.4 |
| 7.5°   | 3090.8 | 3074.1 | 3034.6 | 3045.7 | 3031.6 |
| 10°    | 3057.0 | 3037.3 | 2981.0 | 2972.4 | 2955.6 |
| 12.5°  | 3014.9 | 2989.4 | 2913.1 | 2896.3 | 2865.2 |
| 15°    | 2964.0 | 2932.9 | 2837.1 | 2783.6 | 2755.4 |
| 17.5°  | 2904.7 | 2859.5 | 2741.1 | 2679.2 | 2633.9 |
| 20°    | 2837.1 | 2780.6 | 2639.7 | 2569.3 | 2507.0 |
| 22.5°  | 2763.8 | 2698.8 | 2535.2 | 2439.5 | 2397.2 |
| 25°    | 2690.5 | 2600.2 | 2414.0 | 2298.6 | 2256.1 |
| 27.5°  | 2603.1 | 2507.0 | 2301.2 | 2168.7 | 2103.8 |
| 30°    | 2510.1 | 2402.6 | 2177.1 | 2033.4 | 1957.1 |
| 32.5°  | 2419.7 | 2289.9 | 2058.9 | 1889.5 | 1818.9 |
| 35°    | 2318.3 | 2174.3 | 1926.3 | 1748.6 | 1686.3 |
| 37.5°  | 2219.5 | 2064.3 | 1802.2 | 1607.3 | 1537.0 |
| 40°    | 2115.2 | 1946.1 | 1672.3 | 1472.1 | 1398.8 |
| 42.5°  | 2008.0 | 1827.6 | 1542.7 | 1333.9 | 1263.5 |
| 45°    | 1895.2 | 1706.1 | 1410.2 | 1209.7 | 1142.1 |
| 47.5°  | 1788.1 | 1587.9 | 1283.3 | 1082.8 | 1020.9 |
| 50°    | 1669.5 | 1469.5 | 1159.2 | 964.4  | 905.4  |
| 52.5°  | 1553.8 | 1342.2 | 1040.6 | 854.6  | 801.0  |
| 55°    | 1441.0 | 1221.1 | 916.5  | 747.4  | 693.9  |
| 57.5°  | 1325.5 | 1099.9 | 806.7  | 648.7  | 603.5  |
| 60°    | 1207.0 | 981.4  | 690.9  | 547.2  | 502.1  |
| 62.5°  | 1091.5 | 865.9  | 592.2  | 456.9  | 434.5  |
| 65°    | 973.0  | 744.4  | 490.7  | 395.0  | 386.2  |
| 67.5°  | 860.2  | 631.7  | 395.0  | 346.7  | 338.5  |
| 70°    | 741.7  | 521.9  | 327.0  | 298.9  | 287.6  |
| 72.5°  | 628.9  | 420.1  | 273.5  | 251.1  | 245.3  |
| 75°    | 518.8  | 321.4  | 225.6  | 205.8  | 203.2  |
| 77.5°  | 409.0  | 228.3  | 177.8  | 166.4  | 160.7  |
| 80°    | 307.3  | 163.7  | 135.2  | 124.1  | 124.1  |
| 82.5°  | 214.2  | 110.1  | 93.0   | 87.4   | 87.4   |
| 85°    | 121.2  | 61.9   | 53.5   | 53.5   | 53.5   |
| 87.5°  | 45.1   | 22.4   | 22.4   | 19.8   | 19.8   |
| 90°    | 2.6    | 33.1   | 55.1   | 69.2   | 74.5   |
| 92.5°  | 69.2   | 58.1   | 66.3   | 71.8   | 74.5   |
| 95°    | 179.4  | 88.2   | 107.5  | 121.7  | 118.8  |
| 97.5°  | 323.1  | 96.8   | 140.7  | 149.2  | 151.8  |
| 100°   | 489.0  | 110.6  | 157.4  | 179.4  | 185.0  |
| 102.5° | 671.1  | 665.8  | 163.0  | 193.2  | 201.7  |
| 105°   | 839.6  | 922.6  | 168.6  | 198.8  | 209.9  |
| 107.5° | 1035.7 | 1104.6 | 174.2  | 204.3  | 215.5  |
| 110°   | 1223.6 | 1281.4 | 483.4  | 207.3  | 218.1  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1400.5 | 1449.9 | 1403.1 | 212.5  | 221.0  |
| 115°   | 1588.0 | 1635.0 | 1704.1 | 425.4  | 226.7  |
| 117.5° | 1751.1 | 1806.2 | 1853.4 | 1458.1 | 734.7  |
| 120°   | 1933.4 | 1974.7 | 2024.6 | 2057.8 | 1684.8 |
| 122.5° | 2087.9 | 2132.2 | 2187.6 | 2204.0 | 2207.0 |
| 125°   | 2245.3 | 2281.4 | 2333.9 | 2353.2 | 2361.4 |
| 127.5° | 2389.0 | 2427.7 | 2469.4 | 2496.9 | 2499.5 |
| 130°   | 2524.4 | 2568.7 | 2598.8 | 2629.4 | 2626.7 |
| 132.5° | 2662.5 | 2698.6 | 2728.7 | 2753.7 | 2751.1 |
| 135°   | 2778.6 | 2822.9 | 2847.5 | 2875.4 | 2869.8 |
| 137.5° | 2900.0 | 2933.1 | 2961.0 | 2988.5 | 2980.3 |
| 140°   | 3018.7 | 3041.0 | 3071.1 | 3096.1 | 3082.4 |
| 142.5° | 3118.4 | 3137.8 | 3173.5 | 3195.5 | 3181.7 |
| 145°   | 3223.4 | 3220.4 | 3267.3 | 3286.7 | 3272.8 |
| 147.5° | 3314.2 | 3306.0 | 3352.9 | 3366.7 | 3355.9 |
| 150°   | 3402.7 | 3383.4 | 3427.7 | 3444.1 | 3430.3 |
| 152.5° | 3477.2 | 3455.2 | 3496.6 | 3513.3 | 3493.9 |
| 155°   | 3549.0 | 3524.4 | 3557.6 | 3574.0 | 3552.0 |
| 157.5° | 3607.0 | 3585.1 | 3610.1 | 3629.4 | 3607.0 |
| 160°   | 3656.9 | 3640.2 | 3656.9 | 3673.3 | 3654.0 |
| 162.5° | 3700.9 | 3684.5 | 3698.3 | 3717.6 | 3692.7 |
| 165°   | 3739.6 | 3723.2 | 3731.4 | 3750.8 | 3731.4 |
| 167.5° | 3770.1 | 3753.3 | 3761.9 | 3781.2 | 3756.3 |
| 170°   | 3795.0 | 3778.3 | 3783.9 | 3803.2 | 3778.3 |
| 172.5° | 3811.4 | 3795.0 | 3800.6 | 3820.0 | 3795.0 |
| 175°   | 3825.1 | 3805.8 | 3811.4 | 3830.8 | 3803.2 |
| 177.5° | 3830.8 | 3811.4 | 3814.4 | 3833.7 | 3808.8 |
| 180°   | 3817.0 | 3817.0 | 3817.0 | 3817.0 | 3817.0 |

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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 | 8.65             | 9.38  | 9.72  | 10.45 | 11.91 | 4.63           | 5.36 | 5.70 | 6.43 | 7.88  |
|                 | 3H   | 10.32            | 10.98 | 11.40 | 12.05 | 13.53 | 5.81           | 6.46 | 6.89 | 7.54 | 9.01  |
|                 | 4H   | 10.93            | 11.55 | 12.02 | 12.63 | 14.11 | 6.26           | 6.87 | 7.35 | 7.95 | 9.43  |
|                 | 6H   | 11.35            | 11.91 | 12.45 | 13.00 | 14.49 | 6.57           | 7.14 | 7.67 | 8.22 | 9.72  |
|                 | 8H   | 11.47            | 12.01 | 12.57 | 13.11 | 14.59 | 6.66           | 7.20 | 7.77 | 8.30 | 9.79  |
|                 | 12H  | 11.53            | 12.04 | 12.64 | 13.13 | 14.64 | 6.70           | 7.22 | 7.81 | 8.31 | 9.82  |
| 4H              | 2H   | 8.66             | 9.28  | 9.76  | 10.36 | 11.84 | 5.21           | 5.83 | 6.31 | 6.91 | 8.39  |
|                 | 3H   | 10.48            | 11.00 | 11.58 | 12.10 | 13.59 | 6.55           | 7.07 | 7.66 | 8.17 | 9.67  |
|                 | 4H   | 11.17            | 11.64 | 12.28 | 12.74 | 14.25 | 7.10           | 7.57 | 8.21 | 8.67 | 10.18 |
|                 | 6H   | 11.68            | 12.08 | 12.80 | 13.20 | 14.71 | 7.51           | 7.92 | 8.63 | 9.04 | 10.54 |
|                 | 8H   | 11.85            | 12.23 | 12.97 | 13.34 | 14.86 | 7.64           | 8.02 | 8.76 | 9.13 | 10.65 |
|                 | 12H  | 11.94            | 12.29 | 13.08 | 13.41 | 14.94 | 7.70           | 8.04 | 8.84 | 9.17 | 10.69 |
| 8H              | 4H   | 11.13            | 11.51 | 12.25 | 12.62 | 14.14 | 7.37           | 7.75 | 8.49 | 8.86 | 10.38 |
|                 | 6H   | 11.69            | 12.01 | 12.83 | 13.16 | 14.68 | 7.89           | 8.20 | 9.03 | 9.35 | 10.87 |
|                 | 8H   | 11.91            | 12.18 | 13.05 | 13.32 | 14.85 | 8.08           | 8.35 | 9.22 | 9.49 | 11.02 |
|                 | 12H  | 12.05            | 12.29 | 13.19 | 13.42 | 14.99 | 8.20           | 8.44 | 9.34 | 9.57 | 11.14 |
| 12H             | 4H   | 11.08            | 11.42 | 12.21 | 12.54 | 14.07 | 7.37           | 7.71 | 8.50 | 8.84 | 10.36 |
|                 | 6H   | 11.67            | 11.94 | 12.81 | 13.08 | 14.61 | 7.94           | 8.21 | 9.08 | 9.34 | 10.88 |
|                 | 8H   | 11.89            | 12.13 | 13.03 | 13.26 | 14.83 | 8.15           | 8.38 | 9.29 | 9.51 | 11.09 |