

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: P908769

Luminaire Tested: DFN2DIP-PN4F0-080D100US840-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P908769  
REPORT IS A COMBINATION OF REPORTS P901245 AND P898053  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN4F0-080D100US840-FLLONL  
Description: 4 foot, Pentagon Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

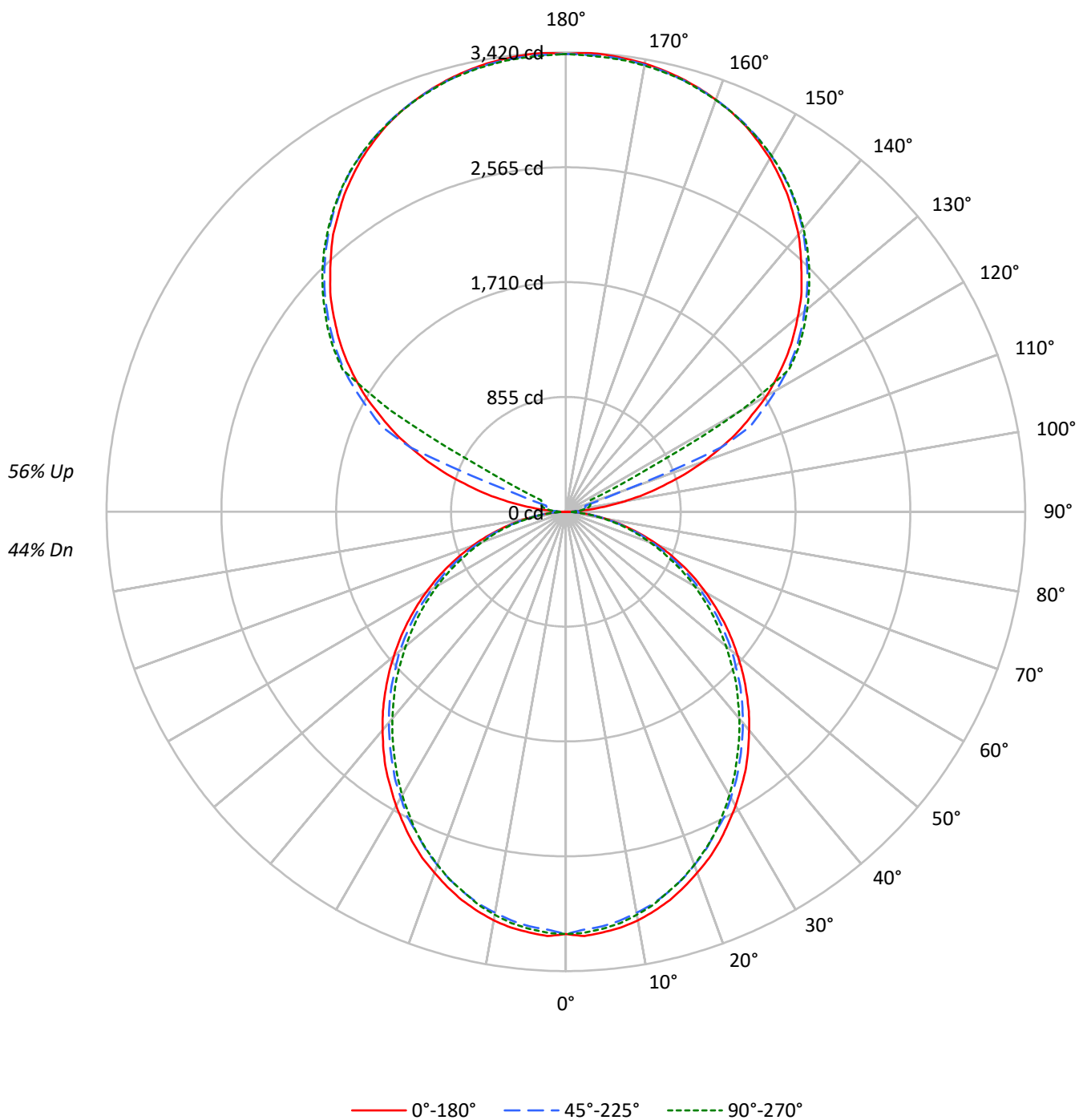
Lumens per Lamp: N/A  
Luminaire Lumens: 17995.8 lumens  
Efficiency: N/A  
Efficacy: 118.3 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.74' x L: 3.94' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 152.1  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9971  
Total Harmonic Distortion (THDi): 0.049  
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 |
| RCR |     |     |     |     |    |    |    |    |    |    |    |  |    |    |    |  |    |
| 0   | 106 | 106 | 106 | 106 | 97 | 97 | 97 | 97 | 80 | 80 | 80 |  | 65 | 65 | 65 |  | 51 |
| 1   | 97  | 92  | 88  | 85  | 88 | 85 | 81 | 78 | 70 | 68 | 66 |  | 57 | 56 | 54 |  | 45 |
| 2   | 88  | 81  | 74  | 69  | 80 | 74 | 69 | 64 | 62 | 58 | 55 |  | 50 | 48 | 45 |  | 40 |
| 3   | 80  | 71  | 64  | 58  | 73 | 65 | 59 | 54 | 54 | 50 | 46 |  | 44 | 41 | 38 |  | 35 |
| 4   | 73  | 63  | 55  | 49  | 67 | 58 | 51 | 46 | 48 | 43 | 39 |  | 40 | 36 | 33 |  | 31 |
| 5   | 67  | 56  | 48  | 42  | 61 | 51 | 44 | 39 | 43 | 38 | 34 |  | 35 | 31 | 28 |  | 28 |
| 6   | 62  | 50  | 42  | 36  | 57 | 46 | 39 | 34 | 39 | 33 | 29 |  | 32 | 28 | 25 |  | 26 |
| 7   | 57  | 45  | 37  | 32  | 52 | 42 | 35 | 30 | 35 | 30 | 26 |  | 29 | 25 | 22 |  | 23 |
| 8   | 53  | 41  | 33  | 28  | 49 | 38 | 31 | 26 | 32 | 27 | 23 |  | 27 | 23 | 20 |  | 22 |
| 9   | 49  | 37  | 30  | 25  | 45 | 35 | 28 | 23 | 29 | 24 | 20 |  | 25 | 20 | 18 |  | 20 |
| 10  | 46  | 34  | 27  | 22  | 42 | 32 | 25 | 21 | 27 | 22 | 18 |  | 23 | 19 | 16 |  | 18 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2295 | 2295 | 2295 |
| 5°  | 2298 | 2263 | 2278 |
| 10° | 2280 | 2233 | 2248 |
| 15° | 2246 | 2196 | 2200 |
| 20° | 2201 | 2146 | 2151 |
| 25° | 2156 | 2085 | 2095 |
| 30° | 2099 | 2028 | 2022 |
| 35° | 2046 | 1962 | 1946 |
| 40° | 1980 | 1894 | 1873 |
| 45° | 1914 | 1827 | 1799 |
| 50° | 1842 | 1756 | 1713 |
| 55° | 1767 | 1674 | 1634 |
| 60° | 1682 | 1576 | 1544 |
| 65° | 1590 | 1476 | 1437 |
| 70° | 1472 | 1353 | 1322 |
| 75° | 1308 | 1206 | 1217 |
| 80° | 1112 | 1020 | 1015 |
| 85° | 804  | 696  | 679  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 1914 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 295.9   | 1.6       |
| 10°-20°   | 832.5   | 4.6       |
| 20°-30°   | 1223.4  | 6.8       |
| 30°-40°   | 1420.9  | 7.9       |
| 40°-50°   | 1419.1  | 7.9       |
| 50°-60°   | 1237.5  | 6.9       |
| 60°-70°   | 914.7   | 5.1       |
| 70°-80°   | 517.6   | 2.9       |
| 80°-90°   | 142.6   | 0.8       |
| 90°-100°  | 112.4   | 0.6       |
| 100°-110° | 418.9   | 2.3       |
| 110°-120° | 1111.1  | 6.2       |
| 120°-130° | 1842.9  | 10.2      |
| 130°-140° | 1957.5  | 10.9      |
| 140°-150° | 1819.3  | 10.1      |
| 150°-160° | 1462.7  | 8.1       |
| 160°-170° | 942.5   | 5.2       |
| 170°-180° | 324.4   | 1.8       |
| 0°-30°    | 2351.8  | 13.1      |
| 0°-40°    | 3772.7  | 21.0      |
| 0°-60°    | 6429.3  | 35.7      |
| 0°-90°    | 8004.2  | 44.5      |
| 90°-120°  | 1642.4  | 9.1       |
| 90°-150°  | 7262.1  | 40.4      |
| 90°-180°  | 9992.0  | 55.5      |
| 0°-180°   | 17995.8 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3144 | 3144  | 3144 | 3144  | 3144 |      |
| 5°   | 3144 | 3132  | 3098 | 3122  | 3117 | 298  |
| 15°  | 2992 | 2975  | 2935 | 2947  | 2932 | 843  |
| 25°  | 2708 | 2684  | 2633 | 2639  | 2633 | 1246 |
| 35°  | 2337 | 2306  | 2258 | 2240  | 2225 | 1459 |
| 45°  | 1902 | 1880  | 1835 | 1802  | 1790 | 1467 |
| 55°  | 1439 | 1421  | 1384 | 1348  | 1333 | 1287 |
| 65°  | 970  | 952   | 922  | 895   | 880  | 959  |
| 75°  | 508  | 502   | 487  | 469   | 475  | 542  |
| 85°  | 124  | 121   | 118  | 109   | 106  | 138  |
| 90°  | 2    | 30    | 49   | 62    | 66   | 17   |
| 95°  | 160  | 79    | 96   | 109   | 106  | 190  |
| 105° | 750  | 824   | 151  | 177   | 187  | 801  |
| 115° | 1418 | 1460  | 1522 | 380   | 202  | 1396 |
| 125° | 2005 | 2037  | 2084 | 2101  | 2108 | 1788 |
| 135° | 2481 | 2520  | 2542 | 2567  | 2562 | 1916 |
| 145° | 2878 | 2876  | 2917 | 2935  | 2922 | 1800 |
| 155° | 3169 | 3147  | 3176 | 3191  | 3172 | 1460 |
| 165° | 3339 | 3324  | 3332 | 3349  | 3332 | 943  |
| 175° | 3416 | 3398  | 3403 | 3420  | 3396 | 325  |
| 180° | 3408 | 3408  | 3408 | 3408  | 3408 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3143.5 | 3143.5 | 3143.5 | 3143.5 | 3143.5 |
| 2.5°   | 3161.8 | 3146.7 | 3113.4 | 3143.5 | 3137.8 |
| 5°     | 3143.5 | 3131.7 | 3098.4 | 3122.4 | 3116.6 |
| 7.5°   | 3122.4 | 3104.4 | 3071.1 | 3095.4 | 3089.4 |
| 10°    | 3089.4 | 3068.2 | 3031.9 | 3056.0 | 3047.1 |
| 12.5°  | 3043.8 | 3025.9 | 2989.6 | 3004.7 | 2998.6 |
| 15°    | 2992.5 | 2974.6 | 2935.1 | 2947.3 | 2932.2 |
| 17.5°  | 2929.0 | 2911.0 | 2871.6 | 2886.7 | 2871.6 |
| 20°    | 2859.4 | 2841.5 | 2799.1 | 2808.1 | 2796.2 |
| 22.5°  | 2790.2 | 2762.9 | 2723.4 | 2723.4 | 2717.3 |
| 25°    | 2708.4 | 2684.3 | 2633.0 | 2638.8 | 2633.0 |
| 27.5°  | 2617.6 | 2596.5 | 2557.3 | 2548.3 | 2533.2 |
| 30°    | 2527.2 | 2502.7 | 2457.6 | 2448.6 | 2436.4 |
| 32.5°  | 2430.3 | 2412.4 | 2363.9 | 2345.6 | 2333.5 |
| 35°    | 2336.6 | 2306.5 | 2258.1 | 2239.8 | 2224.7 |
| 37.5°  | 2230.8 | 2203.5 | 2155.2 | 2133.9 | 2118.9 |
| 40°    | 2122.1 | 2097.7 | 2049.3 | 2022.4 | 2010.1 |
| 42.5°  | 2016.3 | 1991.9 | 1943.8 | 1913.3 | 1895.4 |
| 45°    | 1901.5 | 1880.3 | 1834.7 | 1801.7 | 1789.6 |
| 47.5°  | 1789.6 | 1768.4 | 1719.9 | 1686.6 | 1668.6 |
| 50°    | 1671.5 | 1656.5 | 1614.1 | 1571.8 | 1556.7 |
| 52.5°  | 1556.7 | 1535.5 | 1496.4 | 1463.1 | 1441.9 |
| 55°    | 1439.0 | 1420.7 | 1384.5 | 1348.3 | 1333.1 |
| 57.5°  | 1321.0 | 1306.0 | 1266.5 | 1230.2 | 1218.0 |
| 60°    | 1203.0 | 1191.1 | 1148.7 | 1115.4 | 1106.4 |
| 62.5°  | 1088.1 | 1067.0 | 1036.8 | 1006.7 | 994.5  |
| 65°    | 970.5  | 952.2  | 922.0  | 894.7  | 879.7  |
| 67.5°  | 849.5  | 834.1  | 807.2  | 786.1  | 773.9  |
| 70°    | 737.6  | 725.4  | 698.2  | 677.0  | 665.1  |
| 72.5°  | 622.8  | 610.7  | 595.5  | 574.4  | 565.4  |
| 75°    | 507.7  | 501.9  | 486.6  | 468.6  | 474.6  |
| 77.5°  | 405.1  | 392.8  | 386.8  | 377.8  | 368.8  |
| 80°    | 302.5  | 299.2  | 293.2  | 284.2  | 278.0  |
| 82.5°  | 205.6  | 205.6  | 202.7  | 190.5  | 190.5  |
| 85°    | 123.8  | 120.9  | 118.1  | 108.8  | 105.8  |
| 87.5°  | 54.5   | 48.5   | 42.3   | 33.3   | 30.2   |
| 90°    | 2.3    | 29.6   | 49.2   | 61.8   | 66.4   |
| 92.5°  | 61.8   | 51.8   | 59.2   | 64.1   | 66.4   |
| 95°    | 160.2  | 78.8   | 96.0   | 108.7  | 106.0  |
| 97.5°  | 288.4  | 86.3   | 125.6  | 133.2  | 135.6  |
| 100°   | 436.7  | 98.7   | 140.6  | 160.2  | 165.2  |
| 102.5° | 599.2  | 594.5  | 145.5  | 172.5  | 180.1  |
| 105°   | 749.7  | 823.7  | 150.6  | 177.4  | 187.4  |
| 107.5° | 924.8  | 986.3  | 155.5  | 182.5  | 192.4  |
| 110°   | 1092.6 | 1144.2 | 431.6  | 185.1  | 194.7  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1250.4 | 1294.6 | 1252.8 | 189.8  | 197.4  |
| 115°   | 1418.0 | 1459.9 | 1521.7 | 379.8  | 202.4  |
| 117.5° | 1563.5 | 1612.8 | 1654.9 | 1302.0 | 656.0  |
| 120°   | 1726.4 | 1763.2 | 1807.8 | 1837.3 | 1504.4 |
| 122.5° | 1864.3 | 1903.8 | 1953.3 | 1967.9 | 1970.6 |
| 125°   | 2004.9 | 2037.1 | 2084.0 | 2101.2 | 2108.5 |
| 127.5° | 2133.1 | 2167.7 | 2204.8 | 2229.5 | 2231.8 |
| 130°   | 2254.0 | 2293.6 | 2320.6 | 2347.7 | 2345.4 |
| 132.5° | 2377.3 | 2409.5 | 2436.5 | 2458.7 | 2456.4 |
| 135°   | 2481.0 | 2520.5 | 2542.5 | 2567.4 | 2562.4 |
| 137.5° | 2589.4 | 2619.0 | 2643.8 | 2668.5 | 2661.1 |
| 140°   | 2695.3 | 2715.3 | 2742.2 | 2764.5 | 2752.2 |
| 142.5° | 2784.4 | 2801.7 | 2833.6 | 2853.2 | 2841.0 |
| 145°   | 2878.1 | 2875.5 | 2917.4 | 2934.7 | 2922.3 |
| 147.5° | 2959.2 | 2951.9 | 2993.7 | 3006.1 | 2996.5 |
| 150°   | 3038.3 | 3021.0 | 3060.6 | 3075.2 | 3062.9 |
| 152.5° | 3104.7 | 3085.1 | 3122.1 | 3136.9 | 3119.7 |
| 155°   | 3169.0 | 3146.9 | 3176.5 | 3191.2 | 3171.6 |
| 157.5° | 3220.8 | 3201.2 | 3223.4 | 3240.7 | 3220.8 |
| 160°   | 3265.3 | 3250.4 | 3265.3 | 3279.9 | 3262.7 |
| 162.5° | 3304.5 | 3289.8 | 3302.2 | 3319.4 | 3297.2 |
| 165°   | 3339.0 | 3324.4 | 3331.7 | 3349.0 | 3331.7 |
| 167.5° | 3366.3 | 3351.3 | 3359.0 | 3376.3 | 3354.0 |
| 170°   | 3388.5 | 3373.7 | 3378.6 | 3395.9 | 3373.7 |
| 172.5° | 3403.1 | 3388.5 | 3393.6 | 3410.8 | 3388.5 |
| 175°   | 3415.5 | 3398.2 | 3403.1 | 3420.5 | 3395.9 |
| 177.5° | 3420.5 | 3403.1 | 3405.9 | 3423.1 | 3400.8 |
| 180°   | 3408.2 | 3408.2 | 3408.2 | 3408.2 | 3408.2 |

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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 | 9.63             | 10.45 | 10.64 | 11.46 | 12.81 | 9.19           | 10.01 | 10.19 | 11.02 | 12.37 |
|                 | 3H   | 11.29            | 12.02 | 12.30 | 13.04 | 14.41 | 10.81          | 11.54 | 11.82 | 12.56 | 13.93 |
|                 | 4H   | 11.88            | 12.57 | 12.90 | 13.60 | 14.97 | 11.39          | 12.08 | 12.42 | 13.11 | 14.48 |
|                 | 6H   | 12.28            | 12.92 | 13.31 | 13.94 | 15.33 | 11.79          | 12.42 | 12.82 | 13.45 | 14.84 |
|                 | 8H   | 12.38            | 12.99 | 13.42 | 14.04 | 15.42 | 11.89          | 12.50 | 12.93 | 13.54 | 14.93 |
|                 | 12H  | 12.43            | 13.01 | 13.48 | 14.05 | 15.46 | 11.93          | 12.51 | 12.98 | 13.55 | 14.96 |
| 4H              | 2H   | 10.09            | 10.78 | 11.12 | 11.80 | 13.18 | 9.74           | 10.43 | 10.77 | 11.45 | 12.83 |
|                 | 3H   | 11.95            | 12.53 | 12.99 | 13.58 | 14.97 | 11.55          | 12.13 | 12.59 | 13.18 | 14.57 |
|                 | 4H   | 12.67            | 13.20 | 13.71 | 14.24 | 15.65 | 12.25          | 12.78 | 13.30 | 13.82 | 15.23 |
|                 | 6H   | 13.18            | 13.64 | 14.24 | 14.71 | 16.11 | 12.76          | 13.21 | 13.82 | 14.28 | 15.69 |
|                 | 8H   | 13.33            | 13.76 | 14.39 | 14.82 | 16.24 | 12.90          | 13.33 | 13.96 | 14.39 | 15.81 |
|                 | 12H  | 13.40            | 13.79 | 14.48 | 14.86 | 16.29 | 12.96          | 13.35 | 14.04 | 14.42 | 15.85 |
| 8H              | 4H   | 12.86            | 13.28 | 13.92 | 14.35 | 15.77 | 12.49          | 12.91 | 13.55 | 13.97 | 15.40 |
|                 | 6H   | 13.49            | 13.84 | 14.57 | 14.95 | 16.37 | 13.12          | 13.47 | 14.20 | 14.57 | 15.99 |
|                 | 8H   | 13.71            | 14.02 | 14.80 | 15.11 | 16.55 | 13.33          | 13.64 | 14.42 | 14.72 | 16.16 |
|                 | 12H  | 13.85            | 14.12 | 14.94 | 15.20 | 16.68 | 13.44          | 13.72 | 14.54 | 14.80 | 16.28 |
| 12H             | 4H   | 12.84            | 13.23 | 13.92 | 14.30 | 15.73 | 12.48          | 12.86 | 13.56 | 13.94 | 15.37 |
|                 | 6H   | 13.52            | 13.83 | 14.61 | 14.92 | 16.36 | 13.16          | 13.47 | 14.25 | 14.55 | 15.99 |
|                 | 8H   | 13.76            | 14.04 | 14.86 | 15.12 | 16.60 | 13.39          | 13.66 | 14.48 | 14.74 | 16.22 |