

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: P905502

Luminaire Tested: DFN2DIP-HX4F0-080D120US835-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P905502  
REPORT IS A COMBINATION OF REPORTS P899451 AND P896188  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX4F0-080D120US835-FLLFLL  
Description: 4 foot, Hexagon Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

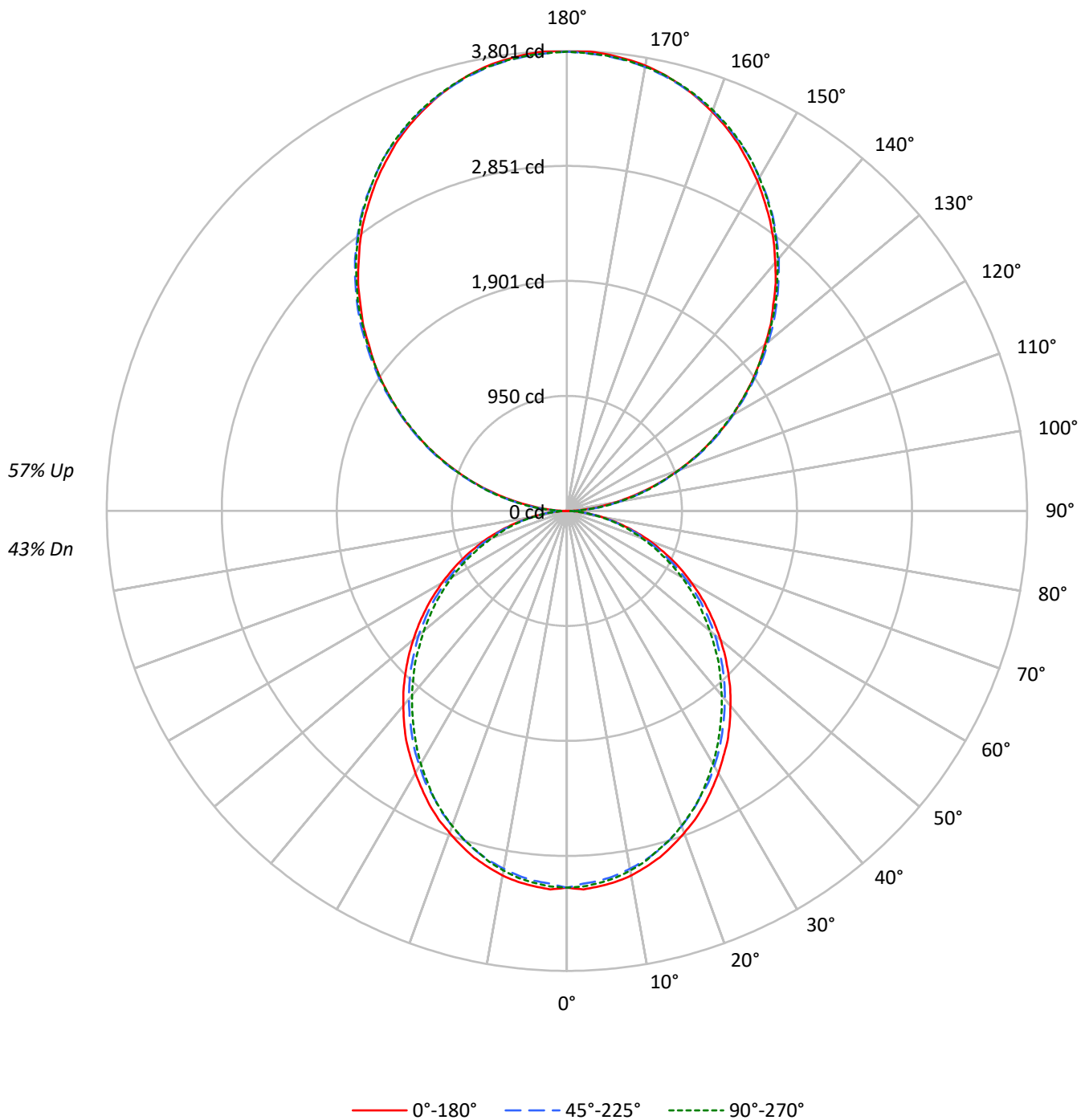
Lumens per Lamp: N/A  
Luminaire Lumens: 18540.0 lumens  
Efficiency: N/A  
Efficacy: 123.7 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.54' x L: 4.09' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 149.9  
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



TEST NUMBER: P905502

CATALOG NUMBER: DFN2DIP-HX4F0-080D120US835-FLLFL

**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   | 105 | 105 | 105 | 105 | 96 | 96 | 96 | 96 | 79 | 79 | 79 | 64 | 64 | 64 | 49 | 49 | 49 |
| 1   | 96  | 92  | 88  | 85  | 88 | 84 | 81 | 78 | 69 | 67 | 65 | 56 | 54 | 53 | 44 | 43 | 42 |
| 2   | 88  | 80  | 74  | 69  | 80 | 73 | 68 | 64 | 61 | 57 | 54 | 49 | 47 | 44 | 38 | 37 | 35 |
| 3   | 80  | 70  | 63  | 57  | 73 | 65 | 58 | 53 | 54 | 49 | 45 | 44 | 40 | 37 | 34 | 32 | 30 |
| 4   | 73  | 62  | 55  | 49  | 66 | 57 | 50 | 45 | 48 | 43 | 39 | 39 | 35 | 32 | 30 | 28 | 26 |
| 5   | 67  | 56  | 47  | 42  | 61 | 51 | 44 | 39 | 43 | 37 | 33 | 35 | 31 | 28 | 27 | 25 | 22 |
| 6   | 62  | 50  | 42  | 36  | 56 | 46 | 39 | 34 | 38 | 33 | 29 | 31 | 27 | 24 | 25 | 22 | 20 |
| 7   | 57  | 45  | 37  | 31  | 52 | 41 | 34 | 29 | 35 | 29 | 25 | 29 | 24 | 21 | 23 | 20 | 18 |
| 8   | 53  | 41  | 33  | 28  | 48 | 38 | 31 | 26 | 32 | 26 | 23 | 26 | 22 | 19 | 21 | 18 | 16 |
| 9   | 49  | 37  | 30  | 25  | 45 | 34 | 28 | 23 | 29 | 24 | 20 | 24 | 20 | 17 | 19 | 16 | 14 |
| 10  | 46  | 34  | 27  | 22  | 42 | 31 | 25 | 21 | 27 | 22 | 18 | 22 | 18 | 15 | 18 | 15 | 13 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2315 | 2315 | 2315 |
| 5°  | 2318 | 2283 | 2298 |
| 10° | 2300 | 2252 | 2267 |
| 15° | 2266 | 2215 | 2218 |
| 20° | 2221 | 2164 | 2169 |
| 25° | 2176 | 2103 | 2111 |
| 30° | 2119 | 2045 | 2038 |
| 35° | 2065 | 1978 | 1961 |
| 40° | 1999 | 1910 | 1887 |
| 45° | 1933 | 1842 | 1812 |
| 50° | 1860 | 1770 | 1725 |
| 55° | 1785 | 1688 | 1645 |
| 60° | 1699 | 1589 | 1553 |
| 65° | 1607 | 1487 | 1445 |
| 70° | 1488 | 1364 | 1329 |
| 75° | 1323 | 1215 | 1222 |
| 80° | 1126 | 1026 | 1016 |
| 85° | 817  | 699  | 676  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 2862 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 293.0   | 1.6       |
| 10°-20°   | 824.3   | 4.4       |
| 20°-30°   | 1211.5  | 6.5       |
| 30°-40°   | 1407.0  | 7.6       |
| 40°-50°   | 1405.3  | 7.6       |
| 50°-60°   | 1225.4  | 6.6       |
| 60°-70°   | 905.8   | 4.9       |
| 70°-80°   | 512.5   | 2.8       |
| 80°-90°   | 146.1   | 0.8       |
| 90°-100°  | 234.8   | 1.3       |
| 100°-110° | 746.2   | 4.0       |
| 110°-120° | 1276.9  | 6.9       |
| 120°-130° | 1679.4  | 9.1       |
| 130°-140° | 1885.0  | 10.2      |
| 140°-150° | 1848.5  | 10.0      |
| 150°-160° | 1550.6  | 8.4       |
| 160°-170° | 1028.3  | 5.5       |
| 170°-180° | 359.4   | 1.9       |
| 0°-30°    | 2328.8  | 12.6      |
| 0°-40°    | 3735.8  | 20.1      |
| 0°-60°    | 6366.4  | 34.3      |
| 0°-90°    | 7930.8  | 42.8      |
| 90°-120°  | 2257.9  | 12.2      |
| 90°-150°  | 7670.8  | 41.4      |
| 90°-180°  | 10609.0 | 57.2      |
| 0°-180°   | 18540.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3113 | 3113  | 3113 | 3113  | 3113 |      |
| 5°   | 3113 | 3101  | 3068 | 3092  | 3086 | 295  |
| 15°  | 2963 | 2946  | 2906 | 2918  | 2904 | 835  |
| 25°  | 2682 | 2658  | 2607 | 2613  | 2607 | 1234 |
| 35°  | 2314 | 2284  | 2236 | 2218  | 2203 | 1445 |
| 45°  | 1883 | 1862  | 1817 | 1784  | 1772 | 1453 |
| 55°  | 1425 | 1407  | 1371 | 1335  | 1320 | 1274 |
| 65°  | 961  | 943   | 913  | 886   | 871  | 950  |
| 75°  | 503  | 497   | 482  | 464   | 470  | 537  |
| 85°  | 123  | 120   | 117  | 108   | 105  | 137  |
| 90°  | 3    | 41    | 112  | 105   | 109  | 18   |
| 95°  | 167  | 199   | 205  | 205   | 199  | 186  |
| 105° | 689  | 698   | 705  | 710   | 710  | 727  |
| 115° | 1281 | 1300  | 1294 | 1291  | 1281 | 1267 |
| 125° | 1864 | 1892  | 1883 | 1873  | 1870 | 1666 |
| 135° | 2411 | 2446  | 2453 | 2450  | 2440 | 1863 |
| 145° | 2927 | 2950  | 2968 | 2971  | 2959 | 1829 |
| 155° | 3347 | 3356  | 3366 | 3382  | 3372 | 1540 |
| 165° | 3641 | 3637  | 3637 | 3660  | 3644 | 1027 |
| 175° | 3788 | 3779  | 3772 | 3795  | 3776 | 360  |
| 180° | 3795 | 3795  | 3795 | 3795  | 3795 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3112.8 | 3112.8 | 3112.8 | 3112.8 | 3112.8 |
| 2.5°   | 3130.9 | 3116.0 | 3083.0 | 3112.8 | 3107.1 |
| 5°     | 3112.8 | 3101.1 | 3068.1 | 3091.9 | 3086.2 |
| 7.5°   | 3091.9 | 3074.1 | 3041.1 | 3065.2 | 3059.2 |
| 10°    | 3059.2 | 3038.2 | 3002.3 | 3026.1 | 3017.3 |
| 12.5°  | 3014.1 | 2996.3 | 2960.4 | 2975.3 | 2969.3 |
| 15°    | 2963.3 | 2945.5 | 2906.4 | 2918.5 | 2903.6 |
| 17.5°  | 2900.4 | 2882.6 | 2843.5 | 2858.5 | 2843.5 |
| 20°    | 2831.5 | 2813.7 | 2771.8 | 2780.7 | 2768.9 |
| 22.5°  | 2762.9 | 2735.9 | 2696.8 | 2696.8 | 2690.8 |
| 25°    | 2681.9 | 2658.1 | 2607.3 | 2613.0 | 2607.3 |
| 27.5°  | 2592.0 | 2571.1 | 2532.3 | 2523.4 | 2508.5 |
| 30°    | 2502.5 | 2478.3 | 2433.6 | 2424.7 | 2412.6 |
| 32.5°  | 2406.6 | 2388.8 | 2340.8 | 2322.7 | 2310.7 |
| 35°    | 2313.8 | 2284.0 | 2236.0 | 2217.9 | 2203.0 |
| 37.5°  | 2209.0 | 2182.0 | 2134.1 | 2113.1 | 2098.2 |
| 40°    | 2101.4 | 2077.2 | 2029.3 | 2002.6 | 1990.5 |
| 42.5°  | 1996.6 | 1972.4 | 1924.8 | 1894.6 | 1876.9 |
| 45°    | 1882.9 | 1861.9 | 1816.8 | 1784.1 | 1772.1 |
| 47.5°  | 1772.1 | 1751.1 | 1703.1 | 1670.1 | 1652.3 |
| 50°    | 1655.2 | 1640.3 | 1598.3 | 1556.4 | 1541.5 |
| 52.5°  | 1541.5 | 1520.5 | 1481.8 | 1448.8 | 1427.8 |
| 55°    | 1424.9 | 1406.8 | 1371.0 | 1335.1 | 1320.1 |
| 57.5°  | 1308.1 | 1293.2 | 1254.1 | 1218.2 | 1206.1 |
| 60°    | 1191.2 | 1179.5 | 1137.5 | 1104.5 | 1095.6 |
| 62.5°  | 1077.5 | 1056.6 | 1026.7 | 996.9  | 984.8  |
| 65°    | 961.0  | 942.9  | 913.0  | 886.0  | 871.1  |
| 67.5°  | 841.2  | 826.0  | 799.3  | 778.4  | 766.3  |
| 70°    | 730.4  | 718.3  | 691.4  | 670.4  | 658.6  |
| 72.5°  | 616.7  | 604.7  | 589.7  | 568.8  | 559.9  |
| 75°    | 502.7  | 497.0  | 481.8  | 464.0  | 470.0  |
| 77.5°  | 401.1  | 389.0  | 383.0  | 374.1  | 365.2  |
| 80°    | 299.5  | 296.3  | 290.3  | 281.4  | 275.3  |
| 82.5°  | 203.6  | 203.6  | 200.7  | 188.6  | 188.6  |
| 85°    | 122.6  | 119.7  | 116.9  | 107.7  | 104.8  |
| 87.5°  | 54.0   | 48.0   | 41.9   | 33.0   | 29.9   |
| 90°    | 3.4    | 41.2   | 112.1  | 105.3  | 108.7  |
| 92.5°  | 70.9   | 96.1   | 99.5   | 103.0  | 103.0  |
| 95°    | 167.0  | 199.1  | 204.8  | 204.8  | 199.1  |
| 97.5°  | 278.0  | 307.8  | 320.4  | 320.4  | 320.4  |
| 100°   | 406.2  | 432.5  | 441.6  | 441.6  | 438.2  |
| 102.5° | 541.2  | 560.6  | 573.2  | 576.7  | 573.2  |
| 105°   | 688.8  | 697.9  | 704.8  | 710.5  | 710.5  |
| 107.5° | 835.2  | 849.0  | 849.0  | 851.2  | 835.2  |
| 110°   | 977.1  | 995.4  | 995.4  | 995.4  | 986.3  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1130.4 | 1149.9 | 1146.4 | 1137.3 | 1130.4 |
| 115°   | 1281.4 | 1299.8 | 1294.0 | 1290.6 | 1281.4 |
| 117.5° | 1431.3 | 1456.5 | 1440.5 | 1431.3 | 1422.2 |
| 120°   | 1582.4 | 1607.5 | 1582.4 | 1582.4 | 1572.1 |
| 122.5° | 1719.7 | 1751.7 | 1735.7 | 1726.5 | 1719.7 |
| 125°   | 1863.8 | 1892.4 | 1883.3 | 1873.0 | 1869.5 |
| 127.5° | 2004.6 | 2040.0 | 2027.4 | 2013.7 | 2004.6 |
| 130°   | 2136.1 | 2177.3 | 2171.6 | 2164.7 | 2152.1 |
| 132.5° | 2283.7 | 2315.8 | 2318.0 | 2302.0 | 2292.9 |
| 135°   | 2410.7 | 2446.2 | 2453.1 | 2449.6 | 2440.5 |
| 137.5° | 2552.6 | 2581.2 | 2586.9 | 2584.6 | 2570.9 |
| 140°   | 2677.3 | 2705.9 | 2721.9 | 2721.9 | 2709.3 |
| 142.5° | 2805.5 | 2834.1 | 2843.2 | 2846.6 | 2834.1 |
| 145°   | 2926.7 | 2949.6 | 2967.9 | 2971.4 | 2958.8 |
| 147.5° | 3035.4 | 3064.0 | 3077.8 | 3083.5 | 3070.9 |
| 150°   | 3147.6 | 3167.0 | 3179.6 | 3189.9 | 3179.6 |
| 152.5° | 3247.1 | 3266.5 | 3282.6 | 3295.2 | 3282.6 |
| 155°   | 3346.6 | 3355.8 | 3366.1 | 3382.1 | 3371.8 |
| 157.5° | 3432.5 | 3439.3 | 3445.0 | 3467.9 | 3451.9 |
| 160°   | 3509.1 | 3516.0 | 3519.4 | 3538.9 | 3525.1 |
| 162.5° | 3580.0 | 3580.0 | 3583.5 | 3605.2 | 3589.2 |
| 165°   | 3640.7 | 3637.3 | 3637.3 | 3660.1 | 3644.1 |
| 167.5° | 3695.6 | 3685.3 | 3685.3 | 3708.2 | 3692.2 |
| 170°   | 3736.8 | 3727.6 | 3724.2 | 3747.1 | 3727.6 |
| 172.5° | 3765.4 | 3756.2 | 3752.8 | 3775.7 | 3756.2 |
| 175°   | 3788.3 | 3779.1 | 3772.3 | 3795.1 | 3775.7 |
| 177.5° | 3800.9 | 3791.7 | 3784.8 | 3804.3 | 3784.8 |
| 180°   | 3795.1 | 3795.1 | 3795.1 | 3795.1 | 3795.1 |

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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 | 9.48             | 10.28 | 10.50 | 11.31 | 12.68 | 9.05           | 9.85  | 10.06 | 10.87 | 12.24 |
|                 | 3H   | 11.14            | 11.85 | 12.16 | 12.89 | 14.28 | 10.66          | 11.38 | 11.69 | 12.42 | 13.81 |
|                 | 4H   | 11.72            | 12.40 | 12.76 | 13.44 | 14.84 | 11.25          | 11.93 | 12.29 | 12.97 | 14.36 |
|                 | 6H   | 12.12            | 12.75 | 13.17 | 13.79 | 15.20 | 11.64          | 12.27 | 12.69 | 13.31 | 14.72 |
|                 | 8H   | 12.22            | 12.82 | 13.28 | 13.88 | 15.28 | 11.75          | 12.34 | 12.80 | 13.40 | 14.81 |
|                 | 12H  | 12.27            | 12.84 | 13.33 | 13.89 | 15.32 | 11.79          | 12.35 | 12.85 | 13.41 | 14.84 |
| 4H              | 2H   | 9.93             | 10.61 | 10.98 | 11.65 | 13.05 | 9.59           | 10.27 | 10.64 | 11.31 | 12.70 |
|                 | 3H   | 11.80            | 12.36 | 12.85 | 13.43 | 14.84 | 11.40          | 11.97 | 12.46 | 13.04 | 14.45 |
|                 | 4H   | 12.51            | 13.03 | 13.57 | 14.08 | 15.52 | 12.10          | 12.62 | 13.16 | 13.68 | 15.11 |
|                 | 6H   | 13.02            | 13.47 | 14.09 | 14.55 | 15.98 | 12.61          | 13.06 | 13.68 | 14.14 | 15.57 |
|                 | 8H   | 13.17            | 13.59 | 14.24 | 14.66 | 16.10 | 12.76          | 13.17 | 13.83 | 14.25 | 15.69 |
|                 | 12H  | 13.24            | 13.62 | 14.33 | 14.70 | 16.15 | 12.82          | 13.20 | 13.91 | 14.28 | 15.73 |
| 8H              | 4H   | 12.70            | 13.12 | 13.77 | 14.19 | 15.63 | 12.34          | 12.76 | 13.41 | 13.83 | 15.27 |
|                 | 6H   | 13.33            | 13.68 | 14.42 | 14.79 | 16.23 | 12.97          | 13.31 | 14.06 | 14.43 | 15.87 |
|                 | 8H   | 13.55            | 13.85 | 14.65 | 14.95 | 16.41 | 13.18          | 13.49 | 14.28 | 14.58 | 16.04 |
|                 | 12H  | 13.68            | 13.95 | 14.79 | 15.04 | 16.54 | 13.30          | 13.56 | 14.40 | 14.66 | 16.15 |
| 12H             | 4H   | 12.68            | 13.06 | 13.77 | 14.15 | 15.60 | 12.33          | 12.71 | 13.42 | 13.80 | 15.24 |
|                 | 6H   | 13.36            | 13.66 | 14.46 | 14.76 | 16.22 | 13.01          | 13.31 | 14.11 | 14.41 | 15.87 |
|                 | 8H   | 13.60            | 13.87 | 14.70 | 14.96 | 16.46 | 13.24          | 13.51 | 14.35 | 14.60 | 16.10 |