

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: P927000

Luminaire Tested: DFN2DIP-HX4F0-070D090US830-FLLONL

Issue Date: 12/12/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P927000  
REPORT IS A COMBINATION OF REPORTS P900915 AND P896187  
Test Lab: INNOVATION CENTER  
Issue Date: 12/12/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX4F0-070D090US830-FLLONL  
Description: 4 foot, Hexagon Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

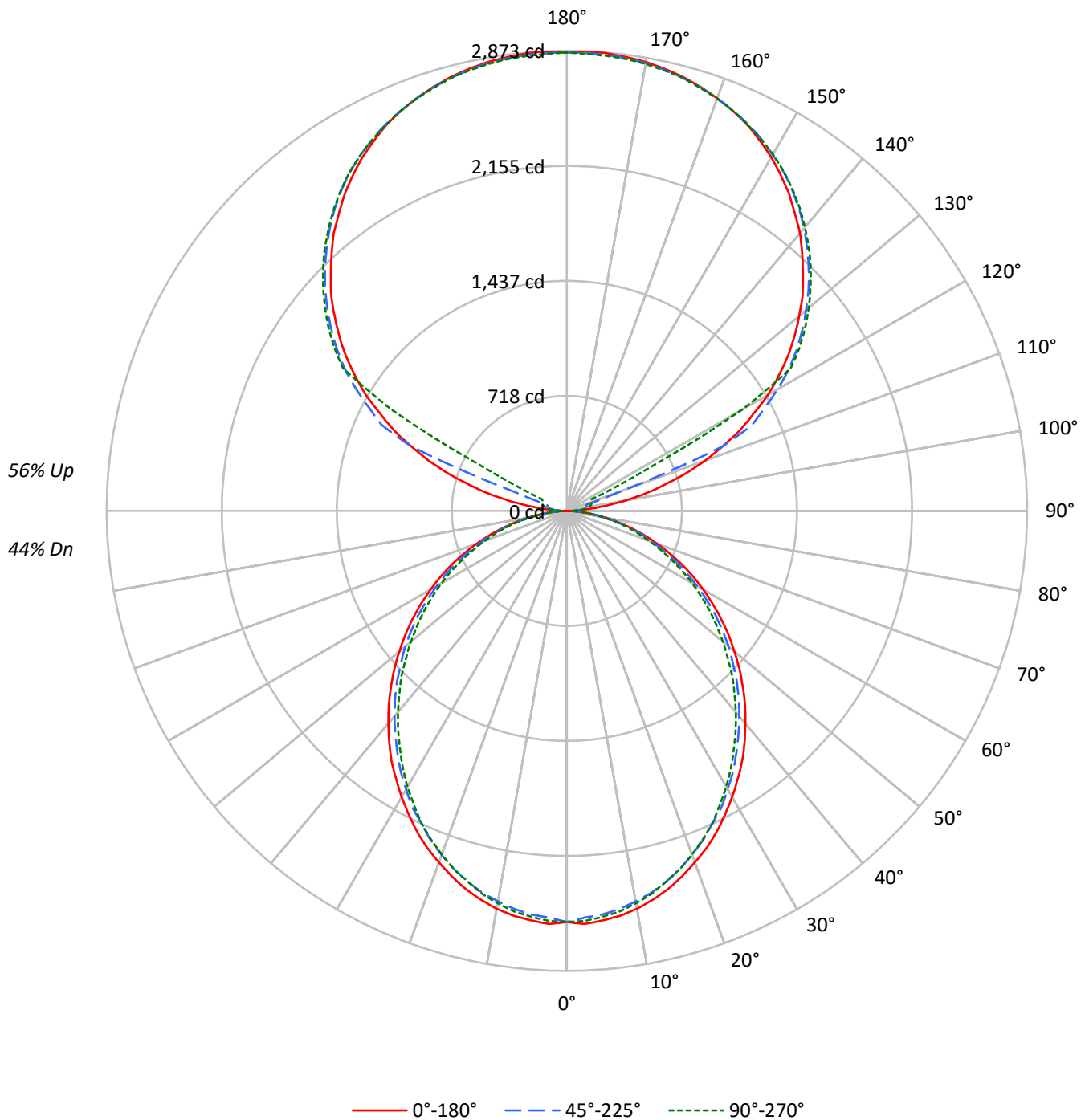
Lumens per Lamp: N/A  
Luminaire Lumens: 14929.2 lumens  
Efficiency: N/A  
Efficacy: 111.2 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.54' x L: 4.09' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 134.2  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9972  
Total Harmonic Distortion (THDi): 0.128  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

TEST NUMBER: P927000

CATALOG NUMBER: DFN2DIP-HX4F0-070D090US830-FLLONL

### Luminous Intensity Polar Plot



TEST NUMBER: P927000

CATALOG NUMBER: DFN2DIP-HX4F0-070D090US830-FLLONL

**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   | 106 | 106 | 106 | 106 | 97 | 97 | 97 | 97 | 80 | 80 | 80 | 65 | 65 | 65 | 50 | 50 | 50 |
| 1   | 96  | 92  | 88  | 85  | 88 | 84 | 81 | 78 | 70 | 68 | 66 | 57 | 55 | 54 | 45 | 44 | 43 |
| 2   | 88  | 80  | 74  | 69  | 80 | 74 | 69 | 64 | 61 | 58 | 54 | 50 | 47 | 45 | 39 | 37 | 36 |
| 3   | 80  | 71  | 63  | 58  | 73 | 65 | 59 | 54 | 54 | 49 | 46 | 44 | 41 | 38 | 35 | 32 | 31 |
| 4   | 73  | 63  | 55  | 49  | 67 | 58 | 51 | 45 | 48 | 43 | 39 | 39 | 35 | 32 | 31 | 28 | 26 |
| 5   | 67  | 56  | 48  | 42  | 61 | 51 | 44 | 39 | 43 | 38 | 33 | 35 | 31 | 28 | 28 | 25 | 23 |
| 6   | 62  | 50  | 42  | 36  | 56 | 46 | 39 | 34 | 39 | 33 | 29 | 32 | 28 | 25 | 25 | 22 | 20 |
| 7   | 57  | 45  | 37  | 32  | 52 | 42 | 35 | 30 | 35 | 30 | 26 | 29 | 25 | 22 | 23 | 20 | 18 |
| 8   | 53  | 41  | 33  | 28  | 48 | 38 | 31 | 26 | 32 | 27 | 23 | 26 | 22 | 19 | 21 | 18 | 16 |
| 9   | 49  | 37  | 30  | 25  | 45 | 34 | 28 | 23 | 29 | 24 | 20 | 24 | 20 | 17 | 20 | 17 | 14 |
| 10  | 46  | 34  | 27  | 22  | 42 | 32 | 25 | 21 | 27 | 22 | 18 | 22 | 18 | 16 | 18 | 15 | 13 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1909 | 1909 | 1909 |
| 5°  | 1912 | 1882 | 1895 |
| 10° | 1897 | 1857 | 1869 |
| 15° | 1869 | 1827 | 1829 |
| 20° | 1831 | 1785 | 1789 |
| 25° | 1794 | 1734 | 1741 |
| 30° | 1747 | 1687 | 1681 |
| 35° | 1703 | 1631 | 1617 |
| 40° | 1648 | 1575 | 1557 |
| 45° | 1594 | 1519 | 1494 |
| 50° | 1534 | 1460 | 1423 |
| 55° | 1472 | 1392 | 1357 |
| 60° | 1402 | 1311 | 1281 |
| 65° | 1325 | 1227 | 1192 |
| 70° | 1227 | 1124 | 1096 |
| 75° | 1091 | 1002 | 1008 |
| 80° | 928  | 846  | 838  |
| 85° | 674  | 577  | 557  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
Vertical Angle: 45°  
Luminance: 1594 cd/sqm

TEST NUMBER: P927000

CATALOG NUMBER: DFN2DIP-HX4F0-070D090US830-FLONL

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 241.6   | 1.6       |
| 10°-20°   | 679.8   | 4.6       |
| 20°-30°   | 999.1   | 6.7       |
| 30°-40°   | 1160.4  | 7.8       |
| 40°-50°   | 1158.9  | 7.8       |
| 50°-60°   | 1010.5  | 6.8       |
| 60°-70°   | 747.0   | 5.0       |
| 70°-80°   | 422.7   | 2.8       |
| 80°-90°   | 116.6   | 0.8       |
| 90°-100°  | 94.4    | 0.6       |
| 100°-110° | 351.9   | 2.4       |
| 110°-120° | 933.3   | 6.3       |
| 120°-130° | 1547.9  | 10.4      |
| 130°-140° | 1644.2  | 11.0      |
| 140°-150° | 1528.2  | 10.2      |
| 150°-160° | 1228.6  | 8.2       |
| 160°-170° | 791.7   | 5.3       |
| 170°-180° | 272.5   | 1.8       |
| 0°-30°    | 1920.5  | 12.9      |
| 0°-40°    | 3080.9  | 20.6      |
| 0°-60°    | 5250.3  | 35.2      |
| 0°-90°    | 6536.6  | 43.8      |
| 90°-120°  | 1379.6  | 9.2       |
| 90°-150°  | 6099.9  | 40.9      |
| 90°-180°  | 8393.0  | 56.2      |
| 0°-180°   | 14929.2 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2567 | 2567  | 2567 | 2567  | 2567 |      |
| 5°   | 2567 | 2558  | 2530 | 2550  | 2545 | 244  |
| 15°  | 2444 | 2429  | 2397 | 2407  | 2394 | 688  |
| 25°  | 2212 | 2192  | 2150 | 2155  | 2150 | 1018 |
| 35°  | 1908 | 1884  | 1844 | 1829  | 1817 | 1192 |
| 45°  | 1553 | 1536  | 1498 | 1471  | 1461 | 1198 |
| 55°  | 1175 | 1160  | 1131 | 1101  | 1089 | 1051 |
| 65°  | 792  | 778   | 753  | 731   | 718  | 784  |
| 75°  | 415  | 410   | 397  | 383   | 388  | 443  |
| 85°  | 101  | 99    | 96   | 89    | 86   | 113  |
| 90°  | 2    | 25    | 41   | 52    | 56   | 14   |
| 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 | 2156  | 2152 | 1610 |
| 145° | 2418 | 2415  | 2450 | 2465  | 2455 | 1512 |
| 155° | 2662 | 2643  | 2668 | 2680  | 2664 | 1227 |
| 165° | 2805 | 2792  | 2799 | 2813  | 2799 | 792  |
| 175° | 2869 | 2854  | 2859 | 2873  | 2852 | 273  |
| 180° | 2863 | 2863  | 2863 | 2863  | 2863 |      |

TEST NUMBER: P927000

CATALOG NUMBER: DFN2DIP-HX4F0-070D090US830-FLLONL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2567.1 | 2567.1 | 2567.1 | 2567.1 | 2567.1 |
| 2.5°   | 2582.1 | 2569.7 | 2542.5 | 2567.1 | 2562.4 |
| 5°     | 2567.1 | 2557.5 | 2530.2 | 2549.8 | 2545.1 |
| 7.5°   | 2549.8 | 2535.1 | 2507.9 | 2527.9 | 2522.9 |
| 10°    | 2522.9 | 2505.5 | 2475.9 | 2495.6 | 2488.3 |
| 12.5°  | 2485.7 | 2471.0 | 2441.5 | 2453.7 | 2448.7 |
| 15°    | 2443.8 | 2429.1 | 2396.9 | 2406.9 | 2394.5 |
| 17.5°  | 2391.9 | 2377.3 | 2345.0 | 2357.4 | 2345.0 |
| 20°    | 2335.0 | 2320.4 | 2285.8 | 2293.2 | 2283.5 |
| 22.5°  | 2278.5 | 2256.3 | 2224.0 | 2224.0 | 2219.0 |
| 25°    | 2211.8 | 2192.1 | 2150.2 | 2154.9 | 2150.2 |
| 27.5°  | 2137.6 | 2120.3 | 2088.4 | 2081.0 | 2068.7 |
| 30°    | 2063.8 | 2043.8 | 2007.0 | 1999.6 | 1989.6 |
| 32.5°  | 1984.6 | 1970.0 | 1930.4 | 1915.5 | 1905.5 |
| 35°    | 1908.2 | 1883.6 | 1844.0 | 1829.1 | 1816.8 |
| 37.5°  | 1821.8 | 1799.5 | 1759.9 | 1742.7 | 1730.3 |
| 40°    | 1733.0 | 1713.1 | 1673.5 | 1651.5 | 1641.6 |
| 42.5°  | 1646.5 | 1626.7 | 1587.4 | 1562.5 | 1547.8 |
| 45°    | 1552.8 | 1535.5 | 1498.3 | 1471.3 | 1461.3 |
| 47.5°  | 1461.3 | 1444.1 | 1404.5 | 1377.3 | 1362.7 |
| 50°    | 1365.0 | 1352.7 | 1318.1 | 1283.6 | 1271.2 |
| 52.5°  | 1271.2 | 1254.0 | 1222.0 | 1194.8 | 1177.5 |
| 55°    | 1175.1 | 1160.2 | 1130.6 | 1101.0 | 1088.7 |
| 57.5°  | 1078.8 | 1066.4 | 1034.2 | 1004.6 | 994.7  |
| 60°    | 982.4  | 972.7  | 938.2  | 910.9  | 903.6  |
| 62.5°  | 888.6  | 871.3  | 846.7  | 822.1  | 812.2  |
| 65°    | 792.5  | 777.6  | 753.0  | 730.7  | 718.4  |
| 67.5°  | 693.8  | 681.2  | 659.2  | 641.9  | 631.9  |
| 70°    | 602.4  | 592.5  | 570.1  | 552.9  | 543.2  |
| 72.5°  | 508.6  | 498.7  | 486.3  | 469.1  | 461.7  |
| 75°    | 414.6  | 409.9  | 397.3  | 382.7  | 387.7  |
| 77.5°  | 330.8  | 320.8  | 315.8  | 308.5  | 301.2  |
| 80°    | 246.9  | 244.4  | 239.4  | 232.0  | 227.0  |
| 82.5°  | 167.9  | 167.9  | 165.5  | 155.6  | 155.6  |
| 85°    | 101.1  | 98.8   | 96.4   | 88.8   | 86.4   |
| 87.5°  | 44.5   | 39.6   | 34.6   | 27.2   | 24.6   |
| 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  | 499.3  | 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°   | 917.7  | 961.1  | 362.6  | 155.4  | 163.6  |

TEST NUMBER: P927000

CATALOG NUMBER: DFN2DIP-HX4F0-070D090US830-FLLONL

**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1050.3 | 1087.5 | 1052.3 | 159.4  | 165.8  |
| 115°   | 1191.0 | 1226.2 | 1278.1 | 319.0  | 169.9  |
| 117.5° | 1313.3 | 1354.7 | 1390.0 | 1093.7 | 551.0  |
| 120°   | 1450.0 | 1481.0 | 1518.5 | 1543.2 | 1263.6 |
| 122.5° | 1566.0 | 1599.1 | 1640.7 | 1653.0 | 1655.2 |
| 125°   | 1684.0 | 1711.0 | 1750.4 | 1764.9 | 1771.1 |
| 127.5° | 1791.7 | 1820.7 | 1852.0 | 1872.7 | 1874.6 |
| 130°   | 1893.3 | 1926.6 | 1949.2 | 1972.0 | 1970.1 |
| 132.5° | 1996.9 | 2023.9 | 2046.5 | 2065.3 | 2063.3 |
| 135°   | 2084.0 | 2117.1 | 2135.6 | 2156.5 | 2152.4 |
| 137.5° | 2175.0 | 2199.8 | 2220.7 | 2241.4 | 2235.2 |
| 140°   | 2264.0 | 2280.8 | 2303.4 | 2322.0 | 2311.8 |
| 142.5° | 2338.8 | 2353.3 | 2380.1 | 2396.6 | 2386.3 |
| 145°   | 2417.5 | 2415.3 | 2450.5 | 2465.0 | 2454.6 |
| 147.5° | 2485.7 | 2479.5 | 2514.7 | 2525.1 | 2516.9 |
| 150°   | 2552.1 | 2537.6 | 2570.8 | 2583.0 | 2572.7 |
| 152.5° | 2607.9 | 2591.4 | 2622.4 | 2634.9 | 2620.4 |
| 155°   | 2661.8 | 2643.3 | 2668.1 | 2680.5 | 2664.0 |
| 157.5° | 2705.4 | 2688.9 | 2707.5 | 2722.0 | 2705.4 |
| 160°   | 2742.7 | 2730.1 | 2742.7 | 2755.0 | 2740.5 |
| 162.5° | 2775.7 | 2763.3 | 2773.7 | 2788.2 | 2769.5 |
| 165°   | 2804.7 | 2792.3 | 2798.6 | 2813.1 | 2798.6 |
| 167.5° | 2827.6 | 2815.1 | 2821.4 | 2835.9 | 2817.2 |
| 170°   | 2846.3 | 2833.7 | 2837.9 | 2852.4 | 2833.7 |
| 172.5° | 2858.6 | 2846.3 | 2850.4 | 2864.9 | 2846.3 |
| 175°   | 2868.9 | 2854.4 | 2858.6 | 2873.0 | 2852.4 |
| 177.5° | 2873.0 | 2858.6 | 2860.8 | 2875.3 | 2856.6 |
| 180°   | 2862.7 | 2862.7 | 2862.7 | 2862.7 | 2862.7 |

TEST NUMBER: P927000

CATALOG NUMBER: DFN2DIP-HX4F0-070D090US830-FLLONL

**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 | 8.92             | 9.72  | 9.92  | 10.74 | 12.10 | 8.48           | 9.29  | 9.49  | 10.31 | 11.67 |
|                 | 3H   | 10.57            | 11.30 | 11.59 | 12.32 | 13.70 | 10.10          | 10.82 | 11.12 | 11.85 | 13.23 |
|                 | 4H   | 11.16            | 11.85 | 12.19 | 12.88 | 14.26 | 10.69          | 11.37 | 11.72 | 12.40 | 13.79 |
|                 | 6H   | 11.56            | 12.19 | 12.60 | 13.22 | 14.62 | 11.08          | 11.71 | 12.12 | 12.75 | 14.14 |
|                 | 8H   | 11.66            | 12.26 | 12.71 | 13.31 | 14.71 | 11.18          | 11.79 | 12.23 | 12.84 | 14.23 |
|                 | 12H  | 11.71            | 12.28 | 12.76 | 13.32 | 14.74 | 11.23          | 11.80 | 12.28 | 12.84 | 14.26 |
| 4H              | 2H   | 9.37             | 10.06 | 10.41 | 11.09 | 12.47 | 9.03           | 9.71  | 10.06 | 10.74 | 12.13 |
|                 | 3H   | 11.23            | 11.81 | 12.28 | 12.87 | 14.26 | 10.84          | 11.41 | 11.89 | 12.47 | 13.87 |
|                 | 4H   | 11.95            | 12.47 | 13.00 | 13.52 | 14.94 | 11.54          | 12.07 | 12.59 | 13.12 | 14.54 |
|                 | 6H   | 12.46            | 12.91 | 13.52 | 13.98 | 15.40 | 12.05          | 12.50 | 13.11 | 13.57 | 14.99 |
|                 | 8H   | 12.61            | 13.03 | 13.67 | 14.10 | 15.53 | 12.20          | 12.62 | 13.26 | 13.68 | 15.11 |
|                 | 12H  | 12.68            | 13.06 | 13.76 | 14.14 | 15.58 | 12.26          | 12.64 | 13.34 | 13.72 | 15.15 |
| 8H              | 4H   | 12.14            | 12.56 | 13.20 | 13.63 | 15.06 | 11.78          | 12.20 | 12.84 | 13.27 | 14.70 |
|                 | 6H   | 12.77            | 13.12 | 13.86 | 14.23 | 15.65 | 12.41          | 12.76 | 13.49 | 13.86 | 15.29 |
|                 | 8H   | 12.99            | 13.30 | 14.08 | 14.39 | 15.84 | 12.62          | 12.93 | 13.72 | 14.02 | 15.47 |
|                 | 12H  | 13.12            | 13.39 | 14.22 | 14.48 | 15.96 | 12.74          | 13.01 | 13.83 | 14.09 | 15.58 |
| 12H             | 4H   | 12.12            | 12.50 | 13.20 | 13.58 | 15.02 | 11.77          | 12.15 | 12.85 | 13.23 | 14.67 |
|                 | 6H   | 12.80            | 13.11 | 13.89 | 14.20 | 15.64 | 12.45          | 12.75 | 13.54 | 13.84 | 15.29 |
|                 | 8H   | 13.04            | 13.31 | 14.14 | 14.40 | 15.88 | 12.68          | 12.95 | 13.78 | 14.04 | 15.53 |