

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: P927002

Luminaire Tested: DFN2DIP-HX4F0-070D090US830-RLLONL

Issue Date: 12/12/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P927002  
REPORT IS A COMBINATION OF REPORTS P900916 AND P896187  
Test Lab: INNOVATION CENTER  
Issue Date: 12/12/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX4F0-070D090US830-RLLONL  
Description: 4 foot, Hexagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

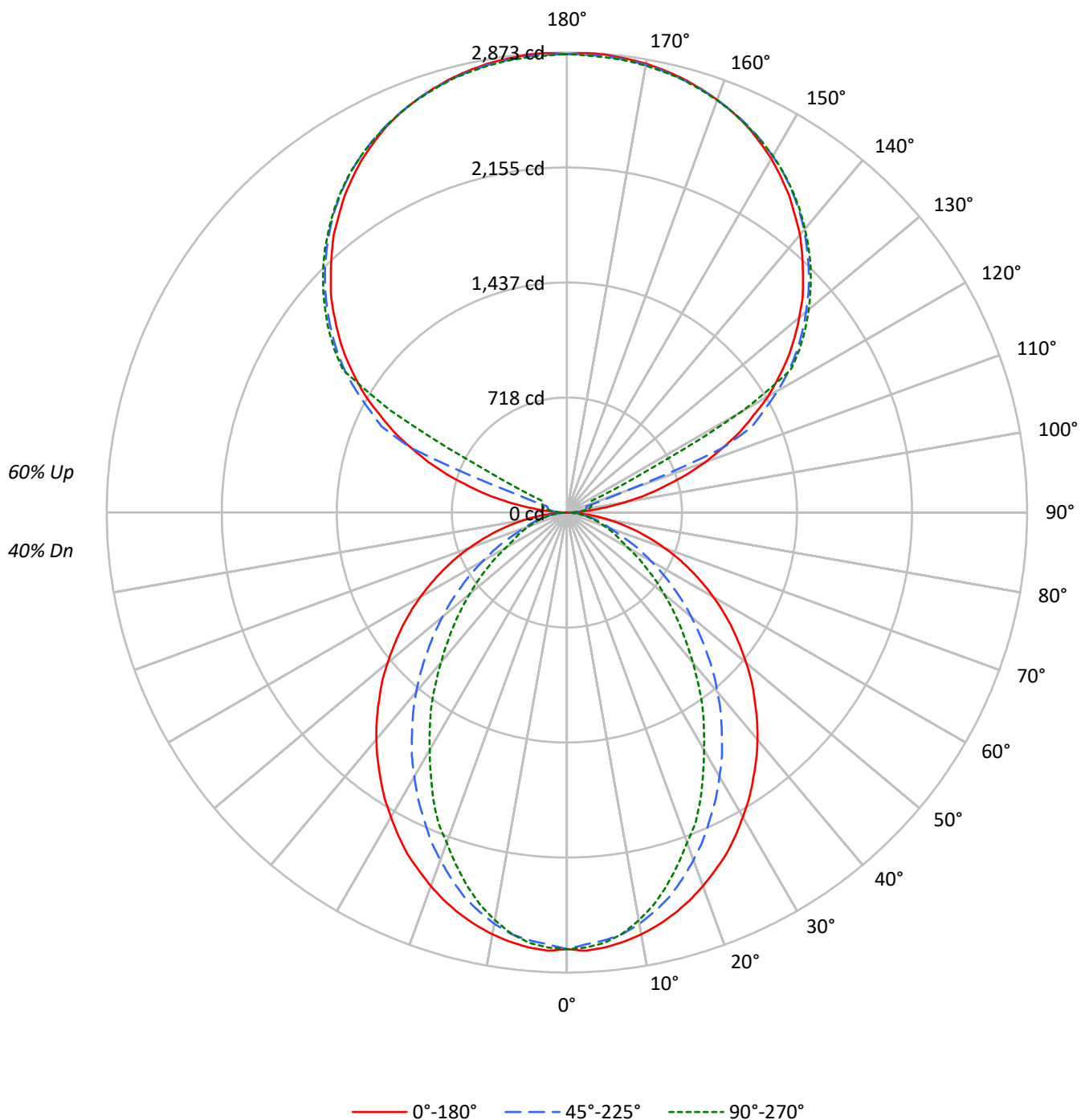
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 14005.5 lumens  
Efficiency: N/A  
Efficacy: 104.4 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: 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: P927002

CATALOG NUMBER: DFN2DIP-HX4F0-070D090US830-RLLONL

### Luminous Intensity Polar Plot



TEST NUMBER: P927002

CATALOG NUMBER: DFN2DIP-HX4F0-070D090US830-RLLONL

**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 | 95 | 95 | 95 | 95 | 78 | 78 | 78 | 62 | 62 | 62 | 47 | 47 | 47 |
| 1   | 96  | 92  | 88  | 85  | 87 | 84 | 81 | 78 | 69 | 67 | 65 | 55 | 53 | 52 | 42 | 41 | 40 |
| 2   | 88  | 81  | 75  | 70  | 80 | 74 | 69 | 64 | 61 | 57 | 54 | 49 | 46 | 44 | 38 | 36 | 35 |
| 3   | 80  | 71  | 64  | 59  | 73 | 65 | 59 | 54 | 54 | 49 | 46 | 43 | 40 | 38 | 34 | 32 | 30 |
| 4   | 74  | 63  | 56  | 50  | 67 | 58 | 51 | 46 | 48 | 43 | 39 | 39 | 35 | 33 | 30 | 28 | 26 |
| 5   | 68  | 56  | 49  | 43  | 61 | 52 | 45 | 40 | 43 | 38 | 34 | 35 | 31 | 28 | 27 | 25 | 23 |
| 6   | 62  | 51  | 43  | 37  | 57 | 47 | 40 | 35 | 39 | 34 | 30 | 32 | 28 | 25 | 25 | 22 | 20 |
| 7   | 58  | 46  | 38  | 33  | 52 | 42 | 35 | 31 | 35 | 30 | 26 | 29 | 25 | 22 | 23 | 20 | 18 |
| 8   | 54  | 42  | 34  | 29  | 49 | 38 | 32 | 27 | 32 | 27 | 24 | 27 | 23 | 20 | 21 | 18 | 16 |
| 9   | 50  | 38  | 31  | 26  | 45 | 35 | 29 | 24 | 30 | 25 | 21 | 24 | 21 | 18 | 20 | 17 | 15 |
| 10  | 47  | 35  | 28  | 23  | 43 | 32 | 26 | 22 | 27 | 22 | 19 | 23 | 19 | 16 | 18 | 16 | 14 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2027 | 2027 | 2027 |
| 5°  | 2031 | 1996 | 2008 |
| 10° | 2011 | 1957 | 1943 |
| 15° | 1983 | 1892 | 1842 |
| 20° | 1947 | 1803 | 1718 |
| 25° | 1910 | 1703 | 1599 |
| 30° | 1859 | 1601 | 1447 |
| 35° | 1810 | 1491 | 1313 |
| 40° | 1760 | 1377 | 1160 |
| 45° | 1702 | 1251 | 1022 |
| 50° | 1642 | 1123 | 887  |
| 55° | 1579 | 987  | 757  |
| 60° | 1507 | 844  | 623  |
| 65° | 1423 | 700  | 561  |
| 70° | 1322 | 564  | 508  |
| 75° | 1195 | 498  | 462  |
| 80° | 1011 | 419  | 401  |
| 85° | 707  | 280  | 302  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 1702 cd/sqm

TEST NUMBER: P927002

CATALOG NUMBER: DFN2DIP-HX4F0-070D090US830-RLLONL

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 255.6   | 1.8       |
| 10°-20°   | 701.5   | 5.0       |
| 20°-30°   | 984.9   | 7.0       |
| 30°-40°   | 1073.7  | 7.7       |
| 40°-50°   | 986.8   | 7.0       |
| 50°-60°   | 775.0   | 5.5       |
| 60°-70°   | 504.4   | 3.6       |
| 70°-80°   | 259.7   | 1.9       |
| 80°-90°   | 71.3    | 0.5       |
| 90°-100°  | 94.4    | 0.7       |
| 100°-110° | 351.9   | 2.5       |
| 110°-120° | 933.3   | 6.7       |
| 120°-130° | 1547.9  | 11.1      |
| 130°-140° | 1644.2  | 11.7      |
| 140°-150° | 1528.2  | 10.9      |
| 150°-160° | 1228.6  | 8.8       |
| 160°-170° | 791.7   | 5.7       |
| 170°-180° | 272.5   | 1.9       |
| 0°-30°    | 1942.0  | 13.9      |
| 0°-40°    | 3015.7  | 21.5      |
| 0°-60°    | 4777.5  | 34.1      |
| 0°-90°    | 5612.8  | 40.1      |
| 90°-120°  | 1379.6  | 9.9       |
| 90°-150°  | 6099.9  | 43.6      |
| 90°-180°  | 8393.0  | 59.9      |
| 0°-180°   | 14005.5 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2727 | 2727  | 2727 | 2727  | 2727 |      |
| 5°   | 2727 | 2714  | 2682 | 2704  | 2697 | 259  |
| 15°  | 2594 | 2566  | 2482 | 2436  | 2411 | 731  |
| 25°  | 2354 | 2275  | 2112 | 2011  | 1974 | 1083 |
| 35°  | 2028 | 1902  | 1686 | 1530  | 1476 | 1270 |
| 45°  | 1658 | 1493  | 1234 | 1058  | 999  | 1281 |
| 55°  | 1261 | 1068  | 802  | 654   | 607  | 1127 |
| 65°  | 851  | 651   | 429  | 346   | 338  | 844  |
| 75°  | 454  | 281   | 197  | 180   | 178  | 480  |
| 85°  | 106  | 54    | 47   | 47    | 47   | 122  |
| 90°  | 2    | 25    | 41   | 52    | 56   | 13   |
| 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: P927002

CATALOG NUMBER: DFN2DIP-HX4F0-070D090US830-RLLONL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2726.7 | 2726.7 | 2726.7 | 2726.7 | 2726.7 |
| 2.5°   | 2739.0 | 2726.7 | 2699.5 | 2724.4 | 2719.4 |
| 5°     | 2726.7 | 2714.4 | 2682.3 | 2704.5 | 2697.2 |
| 7.5°   | 2704.5 | 2689.8 | 2655.3 | 2664.9 | 2652.7 |
| 10°    | 2674.9 | 2657.7 | 2608.4 | 2600.8 | 2586.1 |
| 12.5°  | 2638.0 | 2615.7 | 2549.0 | 2534.3 | 2507.0 |
| 15°    | 2593.5 | 2566.2 | 2482.5 | 2435.6 | 2411.0 |
| 17.5°  | 2541.6 | 2502.1 | 2398.5 | 2344.2 | 2304.7 |
| 20°    | 2482.5 | 2433.0 | 2309.7 | 2248.1 | 2193.7 |
| 22.5°  | 2418.4 | 2361.5 | 2218.3 | 2134.5 | 2097.6 |
| 25°    | 2354.2 | 2275.1 | 2112.2 | 2011.2 | 1974.1 |
| 27.5°  | 2277.7 | 2193.7 | 2013.6 | 1897.6 | 1840.8 |
| 30°    | 2196.3 | 2102.3 | 1904.9 | 1779.3 | 1712.5 |
| 32.5°  | 2117.2 | 2003.7 | 1801.5 | 1653.3 | 1591.5 |
| 35°    | 2028.4 | 1902.5 | 1685.6 | 1530.1 | 1475.6 |
| 37.5°  | 1942.1 | 1806.2 | 1576.9 | 1406.4 | 1344.9 |
| 40°    | 1850.7 | 1702.8 | 1463.2 | 1288.1 | 1223.9 |
| 42.5°  | 1757.0 | 1599.1 | 1349.8 | 1167.1 | 1105.6 |
| 45°    | 1658.3 | 1492.8 | 1233.9 | 1058.5 | 999.3  |
| 47.5°  | 1564.6 | 1389.4 | 1122.9 | 947.5  | 893.3  |
| 50°    | 1460.9 | 1285.8 | 1014.2 | 843.8  | 792.3  |
| 52.5°  | 1359.6 | 1174.4 | 910.5  | 747.7  | 700.8  |
| 55°    | 1260.9 | 1068.4 | 801.9  | 654.0  | 607.2  |
| 57.5°  | 1159.8 | 962.4  | 705.8  | 567.6  | 528.1  |
| 60°    | 1056.2 | 858.7  | 604.5  | 478.9  | 439.3  |
| 62.5°  | 955.0  | 757.7  | 518.1  | 399.8  | 380.1  |
| 65°    | 851.4  | 651.4  | 429.4  | 345.6  | 338.0  |
| 67.5°  | 752.7  | 552.7  | 345.6  | 303.4  | 296.1  |
| 70°    | 649.0  | 456.5  | 286.1  | 261.5  | 251.6  |
| 72.5°  | 550.3  | 367.6  | 239.3  | 219.7  | 214.7  |
| 75°    | 454.0  | 281.1  | 197.4  | 180.1  | 177.8  |
| 77.5°  | 357.9  | 199.7  | 155.5  | 145.5  | 140.6  |
| 80°    | 268.9  | 143.2  | 118.4  | 108.7  | 108.7  |
| 82.5°  | 187.5  | 96.3   | 81.4   | 76.4   | 76.4   |
| 85°    | 106.0  | 54.2   | 46.8   | 46.8   | 46.8   |
| 87.5°  | 39.5   | 19.6   | 19.6   | 17.2   | 17.2   |
| 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: P927002

CATALOG NUMBER: DFN2DIP-HX4F0-070D090US830-RLLONL

**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: P927002

CATALOG NUMBER: DFN2DIP-HX4F0-070D090US830-RLONL

**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 | 8.60             | 9.36  | 9.65  | 10.40 | 11.81 | 4.57           | 5.33 | 5.62 | 6.37 | 7.78  |
|                 | 3H   | 10.27            | 10.95 | 11.33 | 12.00 | 13.43 | 5.76           | 6.43 | 6.81 | 7.49 | 8.92  |
|                 | 4H   | 10.88            | 11.52 | 11.94 | 12.58 | 14.01 | 6.21           | 6.85 | 7.27 | 7.90 | 9.34  |
|                 | 6H   | 11.30            | 11.89 | 12.37 | 12.95 | 14.39 | 6.53           | 7.11 | 7.60 | 8.17 | 9.62  |
|                 | 8H   | 11.42            | 11.98 | 12.50 | 13.06 | 14.50 | 6.62           | 7.17 | 7.69 | 8.25 | 9.69  |
|                 | 12H  | 11.48            | 12.01 | 12.57 | 13.08 | 14.55 | 6.66           | 7.19 | 7.74 | 8.26 | 9.72  |
| 4H              | 2H   | 8.61             | 9.25  | 9.68  | 10.31 | 11.74 | 5.16           | 5.80 | 6.23 | 6.86 | 8.29  |
|                 | 3H   | 10.43            | 10.97 | 11.51 | 12.05 | 13.50 | 6.51           | 7.04 | 7.59 | 8.12 | 9.57  |
|                 | 4H   | 11.12            | 11.61 | 12.21 | 12.69 | 14.15 | 7.05           | 7.54 | 8.14 | 8.61 | 10.08 |
|                 | 6H   | 11.64            | 12.05 | 12.73 | 13.15 | 14.61 | 7.47           | 7.89 | 8.56 | 8.99 | 10.45 |
|                 | 8H   | 11.81            | 12.20 | 12.90 | 13.29 | 14.77 | 7.60           | 7.99 | 8.69 | 9.08 | 10.56 |
|                 | 12H  | 11.90            | 12.25 | 13.01 | 13.36 | 14.84 | 7.66           | 8.01 | 8.77 | 9.12 | 10.60 |
| 8H              | 4H   | 11.09            | 11.48 | 12.18 | 12.57 | 14.04 | 7.33           | 7.72 | 8.42 | 8.81 | 10.29 |
|                 | 6H   | 11.65            | 11.97 | 12.77 | 13.10 | 14.58 | 7.85           | 8.17 | 8.96 | 9.30 | 10.77 |
|                 | 8H   | 11.87            | 12.15 | 12.99 | 13.26 | 14.76 | 8.04           | 8.32 | 9.16 | 9.43 | 10.93 |
|                 | 12H  | 12.00            | 12.25 | 13.13 | 13.36 | 14.89 | 8.16           | 8.40 | 9.28 | 9.51 | 11.05 |
| 12H             | 4H   | 11.04            | 11.39 | 12.14 | 12.49 | 13.97 | 7.33           | 7.68 | 8.44 | 8.79 | 10.27 |
|                 | 6H   | 11.63            | 11.91 | 12.75 | 13.02 | 14.52 | 7.90           | 8.18 | 9.02 | 9.29 | 10.79 |
|                 | 8H   | 11.84            | 12.09 | 12.97 | 13.20 | 14.73 | 8.10           | 8.35 | 9.23 | 9.46 | 10.99 |