

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: P929268

Luminaire Tested: DFN2DIP-HX4F0-070D090US940-FLLONL

Issue Date: 12/12/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P929268  
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-HX4F0-070D090US940-FLLONL  
Description: 4 foot, Hexagon Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

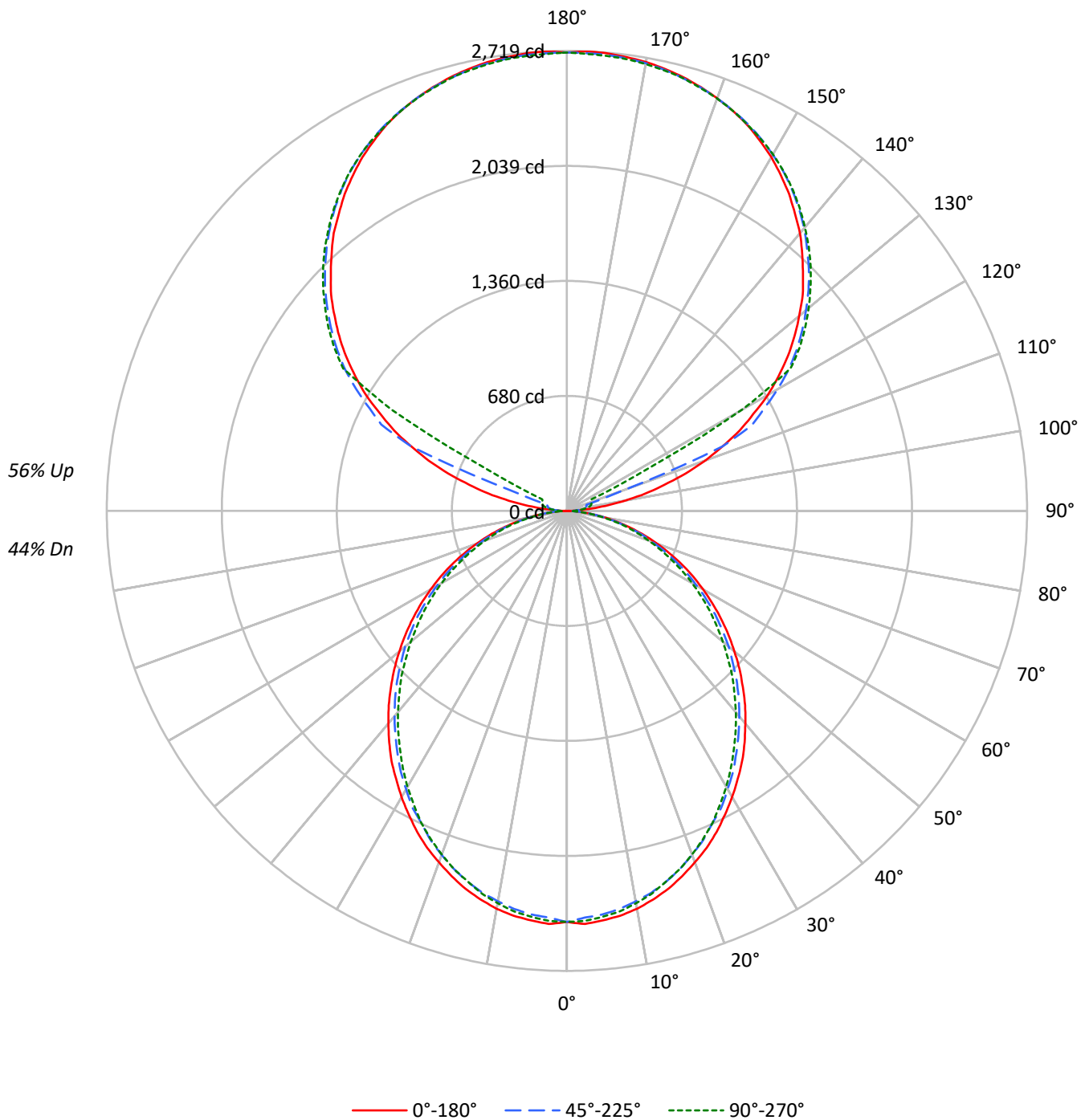
Lumens per Lamp: N/A  
Luminaire Lumens: 14129.3 lumens  
Efficiency: N/A  
Efficacy: 105.3 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.54' x L: 4.09' x H: 0.1')  
CIE Type: General Diffuse

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

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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   | 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°  | 1806 | 1806 | 1806 |
| 5°  | 1810 | 1782 | 1794 |
| 10° | 1795 | 1758 | 1769 |
| 15° | 1769 | 1729 | 1731 |
| 20° | 1733 | 1689 | 1693 |
| 25° | 1698 | 1641 | 1648 |
| 30° | 1654 | 1596 | 1591 |
| 35° | 1612 | 1544 | 1530 |
| 40° | 1560 | 1491 | 1473 |
| 45° | 1508 | 1438 | 1414 |
| 50° | 1452 | 1382 | 1346 |
| 55° | 1393 | 1317 | 1284 |
| 60° | 1326 | 1240 | 1212 |
| 65° | 1254 | 1161 | 1128 |
| 70° | 1161 | 1064 | 1037 |
| 75° | 1033 | 948  | 954  |
| 80° | 879  | 801  | 793  |
| 85° | 638  | 546  | 528  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 1508 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 228.7   | 1.6       |
| 10°-20°   | 643.4   | 4.6       |
| 20°-30°   | 945.5   | 6.7       |
| 30°-40°   | 1098.2  | 7.8       |
| 40°-50°   | 1096.8  | 7.8       |
| 50°-60°   | 956.4   | 6.8       |
| 60°-70°   | 707.0   | 5.0       |
| 70°-80°   | 400.0   | 2.8       |
| 80°-90°   | 110.4   | 0.8       |
| 90°-100°  | 89.3    | 0.6       |
| 100°-110° | 333.0   | 2.4       |
| 110°-120° | 883.3   | 6.3       |
| 120°-130° | 1465.0  | 10.4      |
| 130°-140° | 1556.2  | 11.0      |
| 140°-150° | 1446.3  | 10.2      |
| 150°-160° | 1162.8  | 8.2       |
| 160°-170° | 749.2   | 5.3       |
| 170°-180° | 257.9   | 1.8       |
| 0°-30°    | 1817.6  | 12.9      |
| 0°-40°    | 2915.8  | 20.6      |
| 0°-60°    | 4969.0  | 35.2      |
| 0°-90°    | 6186.4  | 43.8      |
| 90°-120°  | 1305.7  | 9.2       |
| 90°-150°  | 5773.1  | 40.9      |
| 90°-180°  | 7943.0  | 56.2      |
| 0°-180°   | 14129.3 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2430 | 2430  | 2430 | 2430  | 2430 |      |
| 5°   | 2430 | 2420  | 2395 | 2413  | 2409 | 231  |
| 15°  | 2313 | 2299  | 2268 | 2278  | 2266 | 651  |
| 25°  | 2093 | 2075  | 2035 | 2040  | 2035 | 963  |
| 35°  | 1806 | 1783  | 1745 | 1731  | 1719 | 1128 |
| 45°  | 1470 | 1453  | 1418 | 1392  | 1383 | 1134 |
| 55°  | 1112 | 1098  | 1070 | 1042  | 1030 | 994  |
| 65°  | 750  | 736   | 713  | 692   | 680  | 742  |
| 75°  | 392  | 388   | 376  | 362   | 367  | 419  |
| 85°  | 96   | 94    | 91   | 84    | 82   | 107  |
| 90°  | 2    | 24    | 39   | 49    | 53   | 13   |
| 95°  | 127  | 63    | 76   | 86    | 84   | 151  |
| 105° | 596  | 655   | 120  | 141   | 149  | 637  |
| 115° | 1127 | 1160  | 1210 | 302   | 161  | 1110 |
| 125° | 1594 | 1619  | 1657 | 1670  | 1676 | 1421 |
| 135° | 1972 | 2004  | 2021 | 2041  | 2037 | 1524 |
| 145° | 2288 | 2286  | 2319 | 2333  | 2323 | 1431 |
| 155° | 2519 | 2502  | 2525 | 2537  | 2521 | 1161 |
| 165° | 2654 | 2643  | 2649 | 2662  | 2649 | 750  |
| 175° | 2715 | 2701  | 2705 | 2719  | 2700 | 258  |
| 180° | 2709 | 2709  | 2709 | 2709  | 2709 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2429.5 | 2429.5 | 2429.5 | 2429.5 | 2429.5 |
| 2.5°   | 2443.7 | 2432.0 | 2406.3 | 2429.5 | 2425.1 |
| 5°     | 2429.5 | 2420.4 | 2394.7 | 2413.2 | 2408.8 |
| 7.5°   | 2413.2 | 2399.3 | 2373.5 | 2392.4 | 2387.7 |
| 10°    | 2387.7 | 2371.3 | 2343.3 | 2361.9 | 2355.0 |
| 12.5°  | 2352.5 | 2338.6 | 2310.6 | 2322.2 | 2317.5 |
| 15°    | 2312.9 | 2299.0 | 2268.4 | 2277.9 | 2266.2 |
| 17.5°  | 2263.7 | 2249.9 | 2219.4 | 2231.1 | 2219.4 |
| 20°    | 2209.9 | 2196.1 | 2163.4 | 2170.3 | 2161.1 |
| 22.5°  | 2156.4 | 2135.4 | 2104.9 | 2104.9 | 2100.1 |
| 25°    | 2093.3 | 2074.6 | 2035.0 | 2039.5 | 2035.0 |
| 27.5°  | 2023.1 | 2006.7 | 1976.5 | 1969.5 | 1957.9 |
| 30°    | 1953.2 | 1934.3 | 1899.4 | 1892.5 | 1883.0 |
| 32.5°  | 1878.3 | 1864.5 | 1827.0 | 1812.9 | 1803.4 |
| 35°    | 1805.9 | 1782.7 | 1745.2 | 1731.1 | 1719.4 |
| 37.5°  | 1724.1 | 1703.1 | 1665.6 | 1649.3 | 1637.6 |
| 40°    | 1640.1 | 1621.3 | 1583.8 | 1563.1 | 1553.6 |
| 42.5°  | 1558.3 | 1539.5 | 1502.3 | 1478.8 | 1464.8 |
| 45°    | 1469.6 | 1453.2 | 1418.0 | 1392.5 | 1383.0 |
| 47.5°  | 1383.0 | 1366.7 | 1329.3 | 1303.5 | 1289.7 |
| 50°    | 1291.9 | 1280.2 | 1247.5 | 1214.8 | 1203.1 |
| 52.5°  | 1203.1 | 1186.8 | 1156.6 | 1130.8 | 1114.4 |
| 55°    | 1112.1 | 1098.1 | 1070.0 | 1042.0 | 1030.3 |
| 57.5°  | 1021.0 | 1009.3 | 978.8  | 950.8  | 941.4  |
| 60°    | 929.7  | 920.5  | 887.9  | 862.1  | 855.2  |
| 62.5°  | 841.0  | 824.7  | 801.4  | 778.1  | 768.6  |
| 65°    | 750.1  | 735.9  | 712.6  | 691.6  | 679.9  |
| 67.5°  | 656.6  | 644.7  | 623.9  | 607.5  | 598.1  |
| 70°    | 570.1  | 560.7  | 539.6  | 523.2  | 514.1  |
| 72.5°  | 481.3  | 472.0  | 460.3  | 443.9  | 437.0  |
| 75°    | 392.4  | 387.9  | 376.0  | 362.2  | 366.9  |
| 77.5°  | 313.1  | 303.6  | 298.9  | 292.0  | 285.1  |
| 80°    | 233.7  | 231.3  | 226.6  | 219.6  | 214.9  |
| 82.5°  | 158.9  | 158.9  | 156.6  | 147.3  | 147.3  |
| 85°    | 95.7   | 93.5   | 91.3   | 84.0   | 81.8   |
| 87.5°  | 42.1   | 37.5   | 32.7   | 25.8   | 23.3   |
| 90°    | 1.9    | 23.5   | 39.1   | 49.1   | 52.8   |
| 92.5°  | 49.1   | 41.2   | 47.0   | 51.0   | 52.8   |
| 95°    | 127.4  | 62.6   | 76.4   | 86.3   | 84.3   |
| 97.5°  | 229.3  | 68.7   | 99.9   | 105.9  | 107.8  |
| 100°   | 347.1  | 78.5   | 111.8  | 127.4  | 131.3  |
| 102.5° | 476.3  | 472.6  | 115.7  | 137.1  | 143.2  |
| 105°   | 595.9  | 654.9  | 119.6  | 141.1  | 149.0  |
| 107.5° | 735.2  | 784.1  | 123.6  | 145.0  | 153.0  |
| 110°   | 868.5  | 909.6  | 343.2  | 147.1  | 154.9  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 994.0  | 1029.2 | 995.9  | 150.8  | 156.9  |
| 115°   | 1127.2 | 1160.5 | 1209.6 | 301.9  | 160.8  |
| 117.5° | 1242.9 | 1282.1 | 1315.5 | 1035.1 | 521.5  |
| 120°   | 1372.3 | 1401.7 | 1437.1 | 1460.6 | 1195.9 |
| 122.5° | 1482.1 | 1513.5 | 1552.8 | 1564.4 | 1566.5 |
| 125°   | 1593.7 | 1619.3 | 1656.6 | 1670.4 | 1676.2 |
| 127.5° | 1695.7 | 1723.2 | 1752.8 | 1772.3 | 1774.2 |
| 130°   | 1791.8 | 1823.3 | 1844.7 | 1866.3 | 1864.5 |
| 132.5° | 1889.9 | 1915.5 | 1936.9 | 1954.6 | 1952.8 |
| 135°   | 1972.3 | 2003.7 | 2021.2 | 2041.0 | 2037.1 |
| 137.5° | 2058.5 | 2081.9 | 2101.7 | 2121.3 | 2115.5 |
| 140°   | 2142.7 | 2158.6 | 2180.0 | 2197.6 | 2187.9 |
| 142.5° | 2213.5 | 2227.2 | 2252.6 | 2268.2 | 2258.5 |
| 145°   | 2288.0 | 2285.8 | 2319.2 | 2332.9 | 2323.1 |
| 147.5° | 2352.5 | 2346.7 | 2379.9 | 2389.8 | 2382.0 |
| 150°   | 2415.4 | 2401.6 | 2433.0 | 2444.6 | 2434.9 |
| 152.5° | 2468.2 | 2452.6 | 2481.9 | 2493.8 | 2480.0 |
| 155°   | 2519.2 | 2501.7 | 2525.2 | 2536.8 | 2521.2 |
| 157.5° | 2560.4 | 2544.8 | 2562.4 | 2576.2 | 2560.4 |
| 160°   | 2595.7 | 2583.9 | 2595.7 | 2607.4 | 2593.7 |
| 162.5° | 2626.9 | 2615.3 | 2625.1 | 2638.8 | 2621.1 |
| 165°   | 2654.4 | 2642.7 | 2648.6 | 2662.4 | 2648.6 |
| 167.5° | 2676.1 | 2664.2 | 2670.2 | 2683.9 | 2666.3 |
| 170°   | 2693.8 | 2681.9 | 2685.8 | 2699.5 | 2681.9 |
| 172.5° | 2705.4 | 2693.8 | 2697.7 | 2711.4 | 2693.8 |
| 175°   | 2715.2 | 2701.4 | 2705.4 | 2719.1 | 2699.5 |
| 177.5° | 2719.1 | 2705.4 | 2707.5 | 2721.2 | 2703.6 |
| 180°   | 2709.4 | 2709.4 | 2709.4 | 2709.4 | 2709.4 |

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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 | 8.72             | 9.53  | 9.73  | 10.55 | 11.91 | 8.29           | 9.10  | 9.30  | 10.12 | 11.48 |
|                 | 3H   | 10.38            | 11.11 | 11.40 | 12.13 | 13.51 | 9.91           | 10.63 | 10.93 | 11.66 | 13.04 |
|                 | 4H   | 10.97            | 11.65 | 12.00 | 12.68 | 14.07 | 10.49          | 11.18 | 11.53 | 12.21 | 13.60 |
|                 | 6H   | 11.37            | 12.00 | 12.41 | 13.03 | 14.43 | 10.89          | 11.52 | 11.93 | 12.56 | 13.95 |
|                 | 8H   | 11.47            | 12.07 | 12.52 | 13.12 | 14.51 | 10.99          | 11.60 | 12.04 | 12.65 | 14.04 |
|                 | 12H  | 11.52            | 12.09 | 12.57 | 13.13 | 14.55 | 11.03          | 11.61 | 12.09 | 12.65 | 14.07 |
| 4H              | 2H   | 9.18             | 9.87  | 10.22 | 10.90 | 12.28 | 8.84           | 9.52  | 9.87  | 10.55 | 11.94 |
|                 | 3H   | 11.04            | 11.62 | 12.09 | 12.67 | 14.07 | 10.65          | 11.22 | 11.70 | 12.28 | 13.68 |
|                 | 4H   | 11.76            | 12.28 | 12.81 | 13.33 | 14.75 | 11.35          | 11.87 | 12.40 | 12.92 | 14.34 |
|                 | 6H   | 12.27            | 12.72 | 13.33 | 13.79 | 15.21 | 11.86          | 12.31 | 12.92 | 13.38 | 14.80 |
|                 | 8H   | 12.42            | 12.84 | 13.48 | 13.90 | 15.34 | 12.01          | 12.43 | 13.07 | 13.49 | 14.92 |
|                 | 12H  | 12.49            | 12.87 | 13.57 | 13.95 | 15.39 | 12.07          | 12.45 | 13.15 | 13.53 | 14.96 |
| 8H              | 4H   | 11.95            | 12.37 | 13.01 | 13.44 | 14.87 | 11.59          | 12.01 | 12.65 | 13.07 | 14.51 |
|                 | 6H   | 12.58            | 12.93 | 13.67 | 14.03 | 15.46 | 12.22          | 12.56 | 13.30 | 13.67 | 15.10 |
|                 | 8H   | 12.80            | 13.11 | 13.89 | 14.20 | 15.64 | 12.43          | 12.74 | 13.52 | 13.83 | 15.28 |
|                 | 12H  | 12.93            | 13.20 | 14.03 | 14.29 | 15.77 | 12.55          | 12.81 | 13.64 | 13.90 | 15.39 |
| 12H             | 4H   | 11.93            | 12.31 | 13.01 | 13.39 | 14.83 | 11.58          | 11.96 | 12.66 | 13.04 | 14.48 |
|                 | 6H   | 12.61            | 12.91 | 13.70 | 14.01 | 15.45 | 12.26          | 12.56 | 13.35 | 13.65 | 15.10 |
|                 | 8H   | 12.85            | 13.12 | 13.95 | 14.20 | 15.69 | 12.49          | 12.76 | 13.59 | 13.85 | 15.33 |