

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: P913686

Luminaire Tested: DFN2DIP-HX4F0-080D120US927-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P913686  
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-HX4F0-080D120US927-FLLFLL  
Description: 4 foot, Hexagon Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

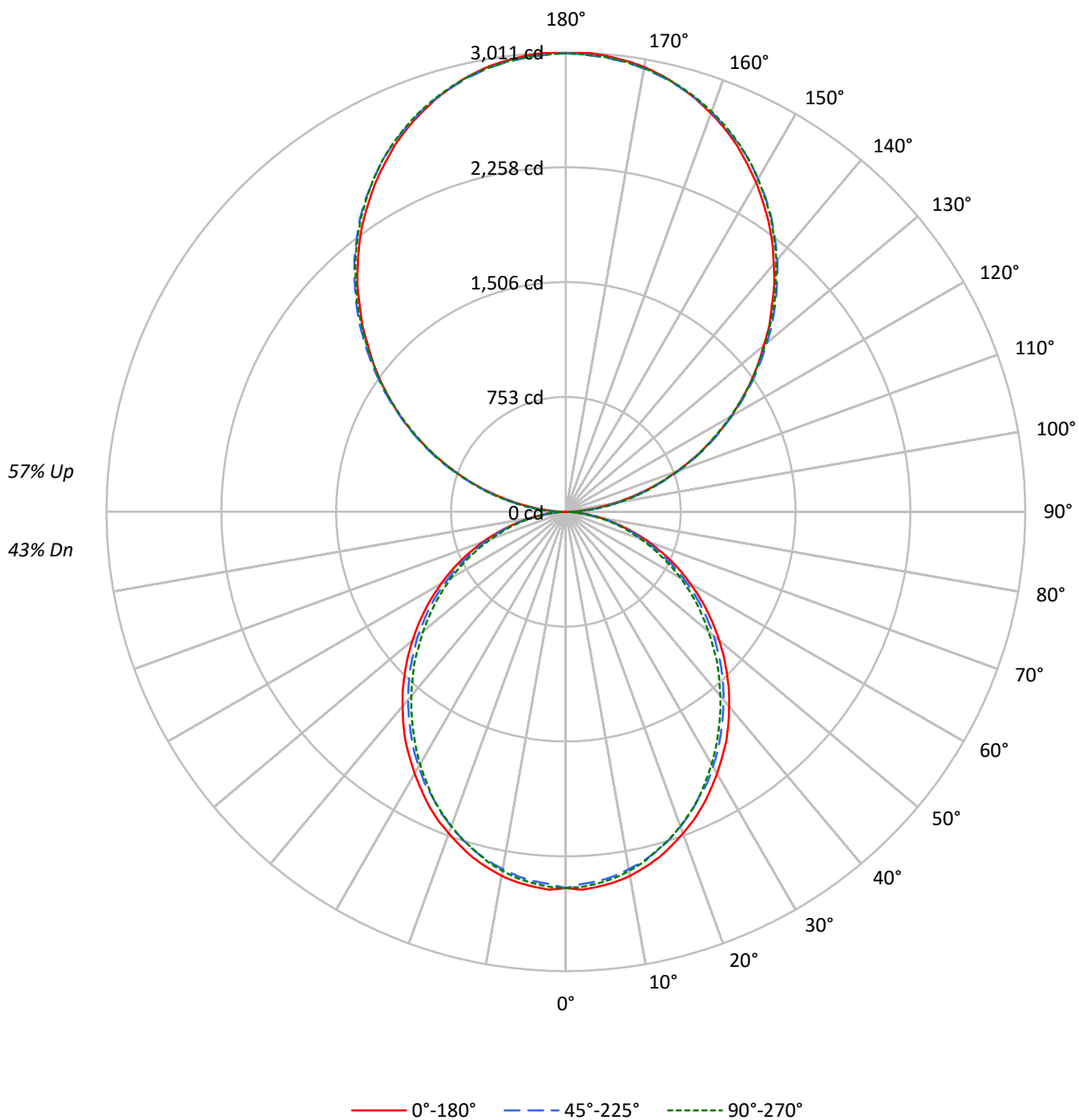
Lumens per Lamp: N/A  
Luminaire Lumens: 14687.0 lumens  
Efficiency: N/A  
Efficacy: 98.0 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.54' x L: 4.09' x H: 0.1')  
CIE Type: General Diffuse

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



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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   | 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°  | 1834 | 1834 | 1834 |
| 5°  | 1837 | 1808 | 1820 |
| 10° | 1822 | 1784 | 1796 |
| 15° | 1795 | 1755 | 1757 |
| 20° | 1759 | 1714 | 1718 |
| 25° | 1723 | 1666 | 1673 |
| 30° | 1678 | 1620 | 1615 |
| 35° | 1636 | 1567 | 1553 |
| 40° | 1583 | 1513 | 1495 |
| 45° | 1531 | 1459 | 1436 |
| 50° | 1474 | 1402 | 1367 |
| 55° | 1414 | 1337 | 1303 |
| 60° | 1346 | 1259 | 1230 |
| 65° | 1273 | 1178 | 1145 |
| 70° | 1179 | 1080 | 1053 |
| 75° | 1048 | 963  | 968  |
| 80° | 892  | 813  | 805  |
| 85° | 647  | 554  | 535  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 2267 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 232.1   | 1.6       |
| 10°-20°   | 653.0   | 4.4       |
| 20°-30°   | 959.7   | 6.5       |
| 30°-40°   | 1114.6  | 7.6       |
| 40°-50°   | 1113.2  | 7.6       |
| 50°-60°   | 970.7   | 6.6       |
| 60°-70°   | 717.6   | 4.9       |
| 70°-80°   | 406.0   | 2.8       |
| 80°-90°   | 115.7   | 0.8       |
| 90°-100°  | 186.0   | 1.3       |
| 100°-110° | 591.1   | 4.0       |
| 110°-120° | 1011.6  | 6.9       |
| 120°-130° | 1330.4  | 9.1       |
| 130°-140° | 1493.3  | 10.2      |
| 140°-150° | 1464.3  | 10.0      |
| 150°-160° | 1228.4  | 8.4       |
| 160°-170° | 814.6   | 5.5       |
| 170°-180° | 284.7   | 1.9       |
| 0°-30°    | 1844.8  | 12.6      |
| 0°-40°    | 2959.4  | 20.2      |
| 0°-60°    | 5043.4  | 34.3      |
| 0°-90°    | 6282.6  | 42.8      |
| 90°-120°  | 1788.7  | 12.2      |
| 90°-150°  | 6076.6  | 41.4      |
| 90°-180°  | 8404.0  | 57.2      |
| 0°-180°   | 14687.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2466 | 2466  | 2466 | 2466  | 2466 |      |
| 5°   | 2466 | 2457  | 2430 | 2449  | 2445 | 234  |
| 15°  | 2348 | 2333  | 2302 | 2312  | 2300 | 661  |
| 25°  | 2125 | 2106  | 2066 | 2070  | 2066 | 978  |
| 35°  | 1833 | 1809  | 1771 | 1757  | 1745 | 1145 |
| 45°  | 1492 | 1475  | 1439 | 1413  | 1404 | 1151 |
| 55°  | 1129 | 1114  | 1086 | 1058  | 1046 | 1009 |
| 65°  | 761  | 747   | 723  | 702   | 690  | 753  |
| 75°  | 398  | 394   | 382  | 368   | 372  | 425  |
| 85°  | 97   | 95    | 93   | 85    | 83   | 108  |
| 90°  | 3    | 33    | 89   | 83    | 86   | 14   |
| 95°  | 132  | 158   | 162  | 162   | 158  | 147  |
| 105° | 546  | 553   | 558  | 563   | 563  | 576  |
| 115° | 1015 | 1030  | 1025 | 1022  | 1015 | 1004 |
| 125° | 1476 | 1499  | 1492 | 1484  | 1481 | 1319 |
| 135° | 1910 | 1938  | 1943 | 1940  | 1933 | 1476 |
| 145° | 2318 | 2337  | 2351 | 2354  | 2344 | 1449 |
| 155° | 2651 | 2658  | 2667 | 2679  | 2671 | 1220 |
| 165° | 2884 | 2881  | 2881 | 2900  | 2887 | 814  |
| 175° | 3001 | 2994  | 2988 | 3006  | 2991 | 285  |
| 180° | 3006 | 3006  | 3006 | 3006  | 3006 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2465.9 | 2465.9 | 2465.9 | 2465.9 | 2465.9 |
| 2.5°   | 2480.2 | 2468.4 | 2442.3 | 2465.9 | 2461.4 |
| 5°     | 2465.9 | 2456.6 | 2430.5 | 2449.3 | 2444.8 |
| 7.5°   | 2449.3 | 2435.2 | 2409.1 | 2428.2 | 2423.4 |
| 10°    | 2423.4 | 2406.8 | 2378.4 | 2397.2 | 2390.2 |
| 12.5°  | 2387.7 | 2373.6 | 2345.2 | 2357.0 | 2352.2 |
| 15°    | 2347.5 | 2333.4 | 2302.4 | 2312.0 | 2300.2 |
| 17.5°  | 2297.6 | 2283.5 | 2252.6 | 2264.4 | 2252.6 |
| 20°    | 2243.1 | 2229.0 | 2195.8 | 2202.8 | 2193.5 |
| 22.5°  | 2188.7 | 2167.3 | 2136.4 | 2136.4 | 2131.6 |
| 25°    | 2124.6 | 2105.7 | 2065.5 | 2070.0 | 2065.5 |
| 27.5°  | 2053.3 | 2036.8 | 2006.0 | 1999.0 | 1987.2 |
| 30°    | 1982.4 | 1963.3 | 1927.9 | 1920.8 | 1911.2 |
| 32.5°  | 1906.5 | 1892.4 | 1854.3 | 1840.0 | 1830.5 |
| 35°    | 1832.9 | 1809.3 | 1771.3 | 1757.0 | 1745.2 |
| 37.5°  | 1749.9 | 1728.5 | 1690.6 | 1674.0 | 1662.2 |
| 40°    | 1664.7 | 1645.5 | 1607.6 | 1586.4 | 1576.8 |
| 42.5°  | 1581.7 | 1562.5 | 1524.8 | 1500.9 | 1486.8 |
| 45°    | 1491.6 | 1475.0 | 1439.2 | 1413.3 | 1403.8 |
| 47.5°  | 1403.8 | 1387.2 | 1349.2 | 1323.0 | 1308.9 |
| 50°    | 1311.2 | 1299.4 | 1266.1 | 1233.0 | 1221.1 |
| 52.5°  | 1221.1 | 1204.5 | 1173.9 | 1147.7 | 1131.1 |
| 55°    | 1128.8 | 1114.4 | 1086.1 | 1057.6 | 1045.8 |
| 57.5°  | 1036.3 | 1024.4 | 993.5  | 965.0  | 955.4  |
| 60°    | 943.6  | 934.4  | 901.1  | 875.0  | 867.9  |
| 62.5°  | 853.6  | 837.0  | 813.3  | 789.7  | 780.1  |
| 65°    | 761.3  | 746.9  | 723.3  | 701.9  | 690.1  |
| 67.5°  | 666.4  | 654.3  | 633.2  | 616.6  | 607.0  |
| 70°    | 578.6  | 569.0  | 547.7  | 531.1  | 521.7  |
| 72.5°  | 488.5  | 479.0  | 467.1  | 450.6  | 443.5  |
| 75°    | 398.2  | 393.7  | 381.7  | 367.6  | 372.3  |
| 77.5°  | 317.7  | 308.2  | 303.4  | 296.4  | 289.3  |
| 80°    | 237.3  | 234.7  | 230.0  | 222.9  | 218.1  |
| 82.5°  | 161.3  | 161.3  | 159.0  | 149.4  | 149.4  |
| 85°    | 97.1   | 94.8   | 92.6   | 85.3   | 83.0   |
| 87.5°  | 42.8   | 38.0   | 33.2   | 26.1   | 23.7   |
| 90°    | 2.7    | 32.6   | 88.8   | 83.4   | 86.1   |
| 92.5°  | 56.2   | 76.1   | 78.8   | 81.6   | 81.6   |
| 95°    | 132.3  | 157.7  | 162.2  | 162.2  | 157.7  |
| 97.5°  | 220.2  | 243.8  | 253.8  | 253.8  | 253.8  |
| 100°   | 321.8  | 342.6  | 349.8  | 349.8  | 347.1  |
| 102.5° | 428.7  | 444.1  | 454.1  | 456.9  | 454.1  |
| 105°   | 545.7  | 552.9  | 558.3  | 562.8  | 562.8  |
| 107.5° | 661.6  | 672.6  | 672.6  | 674.3  | 661.6  |
| 110°   | 774.0  | 788.5  | 788.5  | 788.5  | 781.3  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 895.5  | 910.9  | 908.2  | 900.9  | 895.5  |
| 115°   | 1015.1 | 1029.7 | 1025.1 | 1022.4 | 1015.1 |
| 117.5° | 1133.8 | 1153.8 | 1141.1 | 1133.8 | 1126.6 |
| 120°   | 1253.5 | 1273.4 | 1253.5 | 1253.5 | 1245.4 |
| 122.5° | 1362.3 | 1387.7 | 1375.0 | 1367.7 | 1362.3 |
| 125°   | 1476.5 | 1499.1 | 1491.9 | 1483.8 | 1481.0 |
| 127.5° | 1588.0 | 1616.0 | 1606.1 | 1595.2 | 1588.0 |
| 130°   | 1692.2 | 1724.8 | 1720.3 | 1714.8 | 1704.9 |
| 132.5° | 1809.1 | 1834.5 | 1836.3 | 1823.6 | 1816.4 |
| 135°   | 1909.7 | 1937.8 | 1943.3 | 1940.5 | 1933.3 |
| 137.5° | 2022.1 | 2044.8 | 2049.3 | 2047.5 | 2036.6 |
| 140°   | 2120.9 | 2143.6 | 2156.2 | 2156.2 | 2146.3 |
| 142.5° | 2222.5 | 2245.1 | 2252.3 | 2255.0 | 2245.1 |
| 145°   | 2318.5 | 2336.6 | 2351.1 | 2353.9 | 2343.9 |
| 147.5° | 2404.6 | 2427.2 | 2438.2 | 2442.7 | 2432.7 |
| 150°   | 2493.5 | 2508.8 | 2518.8 | 2527.0 | 2518.8 |
| 152.5° | 2572.3 | 2587.7 | 2600.4 | 2610.4 | 2600.4 |
| 155°   | 2651.1 | 2658.4 | 2666.6 | 2679.2 | 2671.1 |
| 157.5° | 2719.2 | 2724.5 | 2729.1 | 2747.2 | 2734.5 |
| 160°   | 2779.8 | 2785.3 | 2788.0 | 2803.4 | 2792.5 |
| 162.5° | 2836.0 | 2836.0 | 2838.8 | 2856.0 | 2843.3 |
| 165°   | 2884.1 | 2881.4 | 2881.4 | 2899.5 | 2886.8 |
| 167.5° | 2927.6 | 2919.4 | 2919.4 | 2937.6 | 2924.9 |
| 170°   | 2960.2 | 2952.9 | 2950.2 | 2968.4 | 2952.9 |
| 172.5° | 2982.9 | 2975.6 | 2972.9 | 2991.0 | 2975.6 |
| 175°   | 3001.0 | 2993.7 | 2988.3 | 3006.4 | 2991.0 |
| 177.5° | 3011.0 | 3003.7 | 2998.2 | 3013.7 | 2998.2 |
| 180°   | 3006.4 | 3006.4 | 3006.4 | 3006.4 | 3006.4 |

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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 | 8.67             | 9.47  | 9.69  | 10.50 | 11.87 | 8.24           | 9.04  | 9.25  | 10.06 | 11.43 |
|                 | 3H   | 10.33            | 11.04 | 11.35 | 12.08 | 13.47 | 9.85           | 10.57 | 10.88 | 11.61 | 13.00 |
|                 | 4H   | 10.91            | 11.59 | 11.95 | 12.63 | 14.03 | 10.44          | 11.12 | 11.48 | 12.16 | 13.55 |
|                 | 6H   | 11.31            | 11.94 | 12.36 | 12.98 | 14.39 | 10.83          | 11.46 | 11.88 | 12.50 | 13.91 |
|                 | 8H   | 11.41            | 12.01 | 12.47 | 13.07 | 14.47 | 10.94          | 11.53 | 11.99 | 12.59 | 14.00 |
|                 | 12H  | 11.46            | 12.03 | 12.52 | 13.08 | 14.51 | 10.98          | 11.54 | 12.04 | 12.60 | 14.03 |
| 4H              | 2H   | 9.13             | 9.80  | 10.17 | 10.84 | 12.24 | 8.78           | 9.46  | 9.83  | 10.50 | 11.90 |
|                 | 3H   | 10.99            | 11.55 | 12.04 | 12.62 | 14.03 | 10.59          | 11.16 | 11.65 | 12.23 | 13.64 |
|                 | 4H   | 11.70            | 12.22 | 12.76 | 13.28 | 14.71 | 11.29          | 11.81 | 12.35 | 12.87 | 14.30 |
|                 | 6H   | 12.21            | 12.66 | 13.28 | 13.74 | 15.17 | 11.80          | 12.25 | 12.87 | 13.33 | 14.76 |
|                 | 8H   | 12.36            | 12.78 | 13.43 | 13.85 | 15.29 | 11.95          | 12.37 | 13.02 | 13.44 | 14.88 |
|                 | 12H  | 12.43            | 12.81 | 13.52 | 13.89 | 15.34 | 12.01          | 12.39 | 13.10 | 13.47 | 14.92 |
| 8H              | 4H   | 11.89            | 12.31 | 12.96 | 13.38 | 14.82 | 11.53          | 11.95 | 12.60 | 13.02 | 14.46 |
|                 | 6H   | 12.52            | 12.87 | 13.61 | 13.98 | 15.42 | 12.16          | 12.50 | 13.25 | 13.62 | 15.06 |
|                 | 8H   | 12.74            | 13.05 | 13.84 | 14.14 | 15.60 | 12.37          | 12.68 | 13.47 | 13.77 | 15.23 |
|                 | 12H  | 12.87            | 13.14 | 13.98 | 14.23 | 15.73 | 12.49          | 12.75 | 13.59 | 13.85 | 15.35 |
| 12H             | 4H   | 11.87            | 12.25 | 12.96 | 13.34 | 14.79 | 11.52          | 11.90 | 12.61 | 12.99 | 14.43 |
|                 | 6H   | 12.55            | 12.85 | 13.65 | 13.95 | 15.41 | 12.20          | 12.50 | 13.30 | 13.60 | 15.06 |
|                 | 8H   | 12.79            | 13.06 | 13.90 | 14.15 | 15.65 | 12.43          | 12.70 | 13.54 | 13.79 | 15.29 |