

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: P922370

Luminaire Tested: DFN2DIP-PN4F0-070D090US940-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P922370  
REPORT IS A COMBINATION OF REPORTS P899706 AND P896497  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN4F0-070D090US940-RLLFLL  
Description: 4 foot, Pentagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

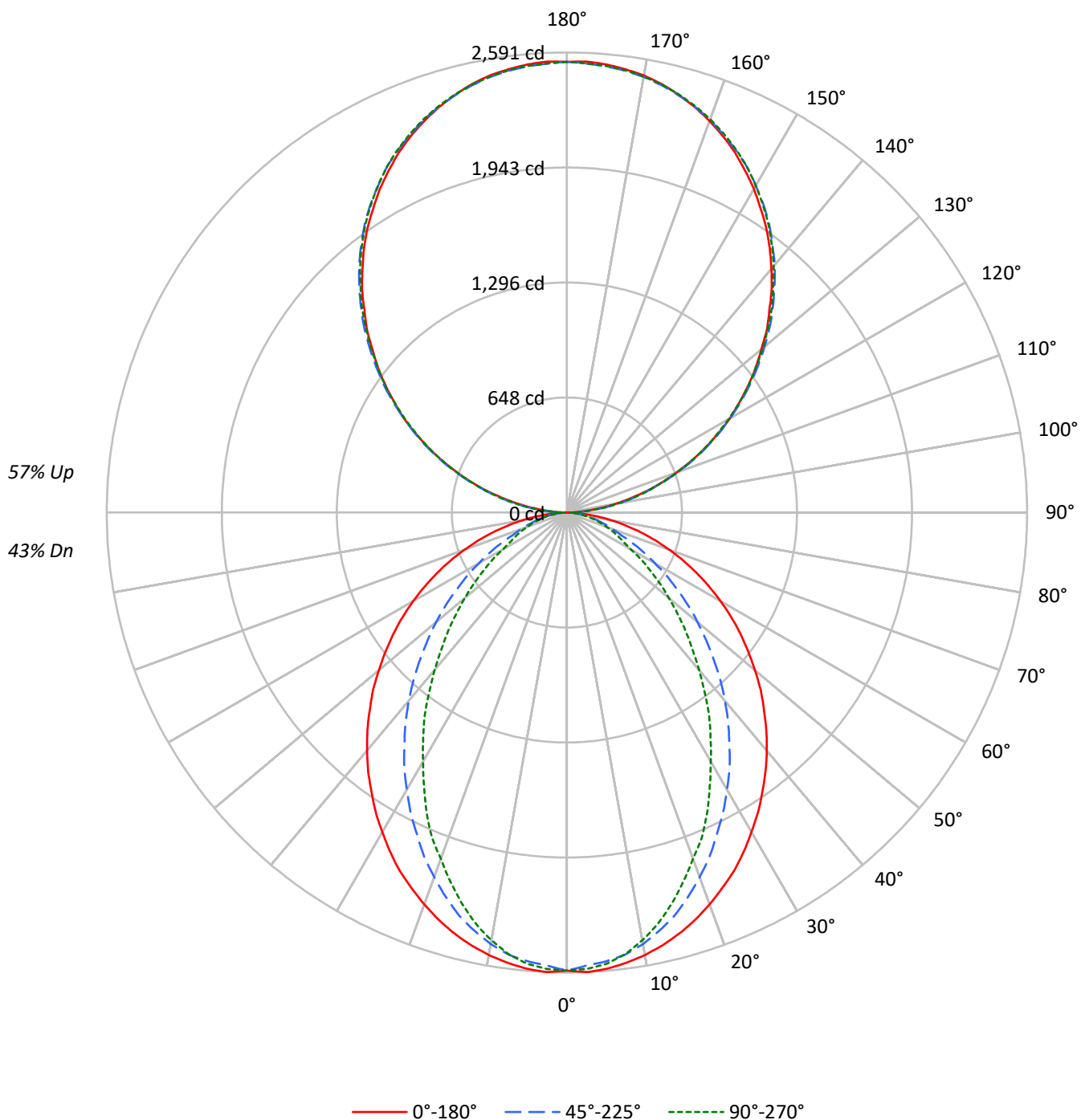
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 12408.1 lumens  
Efficiency: N/A  
Efficacy: 93.1 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.74' x L: 3.94' x H: 0.1')  
CIE Type: General Diffuse  
  
Input Watts (W): 133.3  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9789  
Total Harmonic Distortion (THDi): 0.074  
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: P922370

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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 | 50 | 50 | 50 |
| 1   | 97  | 92  | 89  | 85  | 88 | 85 | 82 | 79 | 70 | 68 | 66 | 57 | 55 | 54 | 44 | 43 | 43 |
| 2   | 88  | 81  | 75  | 70  | 80 | 74 | 69 | 65 | 62 | 58 | 55 | 50 | 48 | 46 | 40 | 38 | 36 |
| 3   | 81  | 72  | 65  | 59  | 74 | 66 | 60 | 55 | 55 | 51 | 47 | 45 | 42 | 39 | 35 | 33 | 32 |
| 4   | 74  | 64  | 56  | 50  | 68 | 59 | 52 | 47 | 49 | 44 | 40 | 40 | 37 | 34 | 32 | 30 | 28 |
| 5   | 68  | 57  | 49  | 43  | 62 | 52 | 46 | 41 | 44 | 39 | 35 | 36 | 32 | 30 | 29 | 26 | 24 |
| 6   | 63  | 51  | 43  | 38  | 57 | 47 | 40 | 35 | 40 | 35 | 31 | 33 | 29 | 26 | 26 | 24 | 22 |
| 7   | 58  | 46  | 39  | 33  | 53 | 43 | 36 | 31 | 36 | 31 | 27 | 30 | 26 | 23 | 24 | 21 | 19 |
| 8   | 54  | 42  | 35  | 29  | 49 | 39 | 32 | 28 | 33 | 28 | 24 | 28 | 24 | 21 | 22 | 19 | 17 |
| 9   | 50  | 38  | 31  | 26  | 46 | 36 | 29 | 25 | 30 | 25 | 22 | 25 | 22 | 19 | 21 | 18 | 16 |
| 10  | 47  | 35  | 28  | 24  | 43 | 33 | 27 | 22 | 28 | 23 | 20 | 23 | 20 | 17 | 19 | 16 | 14 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1883 | 1883 | 1883 |
| 5°  | 1886 | 1854 | 1865 |
| 10° | 1868 | 1817 | 1805 |
| 15° | 1842 | 1758 | 1712 |
| 20° | 1808 | 1675 | 1597 |
| 25° | 1773 | 1582 | 1486 |
| 30° | 1726 | 1487 | 1345 |
| 35° | 1680 | 1385 | 1221 |
| 40° | 1634 | 1280 | 1079 |
| 45° | 1580 | 1162 | 951  |
| 50° | 1524 | 1044 | 825  |
| 55° | 1465 | 917  | 704  |
| 60° | 1397 | 785  | 580  |
| 65° | 1319 | 650  | 522  |
| 70° | 1225 | 525  | 473  |
| 75° | 1106 | 463  | 431  |
| 80° | 935  | 389  | 375  |
| 85° | 651  | 261  | 284  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 1987 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 241.8   | 1.9       |
| 10°-20°   | 663.7   | 5.3       |
| 20°-30°   | 931.9   | 7.5       |
| 30°-40°   | 1015.8  | 8.2       |
| 40°-50°   | 933.6   | 7.5       |
| 50°-60°   | 733.2   | 5.9       |
| 60°-70°   | 477.3   | 3.8       |
| 70°-80°   | 245.7   | 2.0       |
| 80°-90°   | 69.9    | 0.6       |
| 90°-100°  | 157.1   | 1.3       |
| 100°-110° | 499.0   | 4.0       |
| 110°-120° | 854.0   | 6.9       |
| 120°-130° | 1123.1  | 9.1       |
| 130°-140° | 1260.7  | 10.2      |
| 140°-150° | 1236.2  | 10.0      |
| 150°-160° | 1037.0  | 8.4       |
| 160°-170° | 687.7   | 5.5       |
| 170°-180° | 240.4   | 1.9       |
| 0°-30°    | 1837.4  | 14.8      |
| 0°-40°    | 2853.2  | 23.0      |
| 0°-60°    | 4520.0  | 36.4      |
| 0°-90°    | 5312.9  | 42.8      |
| 90°-120°  | 1510.1  | 12.2      |
| 90°-150°  | 5130.1  | 41.3      |
| 90°-180°  | 7095.0  | 57.2      |
| 0°-180°   | 12408.1 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2580 | 2580  | 2580 | 2580  | 2580 |      |
| 5°   | 2580 | 2568  | 2538 | 2559  | 2552 | 245  |
| 15°  | 2454 | 2428  | 2349 | 2304  | 2281 | 691  |
| 25°  | 2227 | 2152  | 1998 | 1903  | 1868 | 1024 |
| 35°  | 1919 | 1800  | 1595 | 1448  | 1396 | 1201 |
| 45°  | 1569 | 1412  | 1167 | 1002  | 946  | 1212 |
| 55°  | 1193 | 1011  | 759  | 619   | 574  | 1066 |
| 65°  | 806  | 616   | 406  | 327   | 320  | 799  |
| 75°  | 430  | 266   | 187  | 170   | 168  | 454  |
| 85°  | 100  | 51    | 44   | 44    | 44   | 115  |
| 90°  | 2    | 28    | 75   | 70    | 73   | 12   |
| 95°  | 112  | 133   | 137  | 137   | 133  | 124  |
| 105° | 461  | 467   | 471  | 475   | 475  | 486  |
| 115° | 857  | 869   | 865  | 863   | 857  | 848  |
| 125° | 1246 | 1266  | 1260 | 1253  | 1250 | 1114 |
| 135° | 1612 | 1636  | 1641 | 1638  | 1632 | 1246 |
| 145° | 1957 | 1973  | 1985 | 1987  | 1979 | 1223 |
| 155° | 2238 | 2244  | 2251 | 2262  | 2255 | 1030 |
| 165° | 2435 | 2432  | 2432 | 2448  | 2437 | 687  |
| 175° | 2534 | 2527  | 2523 | 2538  | 2525 | 241  |
| 180° | 2538 | 2538  | 2538 | 2538  | 2538 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2579.8 | 2579.8 | 2579.8 | 2579.8 | 2579.8 |
| 2.5°   | 2591.4 | 2579.8 | 2554.0 | 2577.6 | 2572.9 |
| 5°     | 2579.8 | 2568.1 | 2537.7 | 2558.8 | 2551.8 |
| 7.5°   | 2558.8 | 2544.9 | 2512.2 | 2521.3 | 2509.7 |
| 10°    | 2530.8 | 2514.4 | 2467.8 | 2460.7 | 2446.8 |
| 12.5°  | 2495.8 | 2474.8 | 2411.6 | 2397.7 | 2371.9 |
| 15°    | 2453.7 | 2427.9 | 2348.7 | 2304.4 | 2281.1 |
| 17.5°  | 2404.7 | 2367.3 | 2269.2 | 2217.9 | 2180.5 |
| 20°    | 2348.7 | 2301.9 | 2185.2 | 2127.0 | 2075.5 |
| 22.5°  | 2288.0 | 2234.3 | 2098.7 | 2019.5 | 1984.6 |
| 25°    | 2227.3 | 2152.5 | 1998.4 | 1902.8 | 1867.7 |
| 27.5°  | 2155.0 | 2075.5 | 1905.1 | 1795.4 | 1741.6 |
| 30°    | 2078.0 | 1989.0 | 1802.2 | 1683.4 | 1620.2 |
| 32.5°  | 2003.1 | 1895.7 | 1704.4 | 1564.2 | 1505.7 |
| 35°    | 1919.1 | 1800.0 | 1594.7 | 1447.6 | 1396.1 |
| 37.5°  | 1837.5 | 1708.9 | 1491.9 | 1330.6 | 1272.5 |
| 40°    | 1751.0 | 1611.1 | 1384.4 | 1218.7 | 1158.0 |
| 42.5°  | 1662.3 | 1513.0 | 1277.1 | 1104.2 | 1046.1 |
| 45°    | 1569.0 | 1412.4 | 1167.4 | 1001.5 | 945.5  |
| 47.5°  | 1480.2 | 1314.6 | 1062.4 | 896.4  | 845.2  |
| 50°    | 1382.2 | 1216.5 | 959.6  | 798.3  | 749.6  |
| 52.5°  | 1286.3 | 1111.2 | 861.5  | 707.4  | 663.1  |
| 55°    | 1192.9 | 1010.8 | 758.7  | 618.8  | 574.4  |
| 57.5°  | 1097.3 | 910.5  | 667.8  | 537.0  | 499.6  |
| 60°    | 999.3  | 812.4  | 571.9  | 453.1  | 415.6  |
| 62.5°  | 903.6  | 716.8  | 490.2  | 378.3  | 359.6  |
| 65°    | 805.5  | 616.3  | 406.3  | 327.0  | 319.8  |
| 67.5°  | 712.1  | 522.9  | 327.0  | 287.0  | 280.2  |
| 70°    | 614.0  | 431.9  | 270.7  | 247.4  | 238.0  |
| 72.5°  | 520.7  | 347.8  | 226.4  | 207.9  | 203.1  |
| 75°    | 429.5  | 266.0  | 186.7  | 170.4  | 168.2  |
| 77.5°  | 338.6  | 189.0  | 147.1  | 137.7  | 133.0  |
| 80°    | 254.4  | 135.5  | 112.0  | 102.8  | 102.8  |
| 82.5°  | 177.4  | 91.1   | 77.0   | 72.3   | 72.3   |
| 85°    | 100.3  | 51.3   | 44.3   | 44.3   | 44.3   |
| 87.5°  | 37.4   | 18.5   | 18.5   | 16.3   | 16.3   |
| 90°    | 2.3    | 27.6   | 75.0   | 70.4   | 72.7   |
| 92.5°  | 47.4   | 64.3   | 66.6   | 68.8   | 68.8   |
| 95°    | 111.7  | 133.1  | 137.0  | 137.0  | 133.1  |
| 97.5°  | 185.9  | 205.8  | 214.3  | 214.3  | 214.3  |
| 100°   | 271.6  | 289.3  | 295.3  | 295.3  | 293.1  |
| 102.5° | 361.9  | 375.0  | 383.3  | 385.7  | 383.3  |
| 105°   | 460.7  | 466.7  | 471.4  | 475.2  | 475.2  |
| 107.5° | 558.6  | 567.8  | 567.8  | 569.3  | 558.6  |
| 110°   | 653.4  | 665.8  | 665.8  | 665.8  | 659.6  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 756.0  | 769.0  | 766.7  | 760.6  | 756.0  |
| 115°   | 857.0  | 869.2  | 865.4  | 863.2  | 857.0  |
| 117.5° | 957.3  | 974.1  | 963.4  | 957.3  | 951.1  |
| 120°   | 1058.3 | 1075.0 | 1058.3 | 1058.3 | 1051.3 |
| 122.5° | 1150.0 | 1171.5 | 1160.8 | 1154.7 | 1150.0 |
| 125°   | 1246.5 | 1265.6 | 1259.5 | 1252.6 | 1250.4 |
| 127.5° | 1340.6 | 1364.3 | 1355.9 | 1346.8 | 1340.6 |
| 130°   | 1428.6 | 1456.2 | 1452.3 | 1447.7 | 1439.3 |
| 132.5° | 1527.3 | 1548.7 | 1550.2 | 1539.5 | 1533.5 |
| 135°   | 1612.2 | 1635.9 | 1640.6 | 1638.3 | 1632.2 |
| 137.5° | 1707.1 | 1726.3 | 1730.1 | 1728.6 | 1719.4 |
| 140°   | 1790.6 | 1809.6 | 1820.3 | 1820.3 | 1812.0 |
| 142.5° | 1876.2 | 1895.3 | 1901.5 | 1903.8 | 1895.3 |
| 145°   | 1957.4 | 1972.6 | 1984.9 | 1987.2 | 1978.8 |
| 147.5° | 2030.1 | 2049.2 | 2058.3 | 2062.2 | 2053.8 |
| 150°   | 2105.1 | 2118.1 | 2126.5 | 2133.3 | 2126.5 |
| 152.5° | 2171.6 | 2184.6 | 2195.3 | 2203.8 | 2195.3 |
| 155°   | 2238.2 | 2244.3 | 2251.2 | 2261.9 | 2255.0 |
| 157.5° | 2295.5 | 2300.2 | 2304.0 | 2319.2 | 2308.5 |
| 160°   | 2346.8 | 2351.4 | 2353.8 | 2366.7 | 2357.5 |
| 162.5° | 2394.2 | 2394.2 | 2396.6 | 2411.1 | 2400.4 |
| 165°   | 2434.8 | 2432.5 | 2432.5 | 2447.8 | 2437.1 |
| 167.5° | 2471.6 | 2464.7 | 2464.7 | 2479.9 | 2469.2 |
| 170°   | 2499.1 | 2493.0 | 2490.7 | 2506.0 | 2493.0 |
| 172.5° | 2518.2 | 2512.1 | 2509.8 | 2525.1 | 2512.1 |
| 175°   | 2533.5 | 2527.4 | 2522.8 | 2538.2 | 2525.1 |
| 177.5° | 2541.9 | 2535.8 | 2531.2 | 2544.2 | 2531.2 |
| 180°   | 2538.2 | 2538.2 | 2538.2 | 2538.2 | 2538.2 |

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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 | 8.64             | 9.42  | 9.66  | 10.44 | 11.82 | 4.61           | 5.38 | 5.63 | 6.41 | 7.78  |
|                 | 3H   | 10.32            | 11.01 | 11.35 | 12.05 | 13.44 | 5.79           | 6.48 | 6.82 | 7.52 | 8.91  |
|                 | 4H   | 10.93            | 11.58 | 11.97 | 12.62 | 14.02 | 6.24           | 6.90 | 7.28 | 7.93 | 9.33  |
|                 | 6H   | 11.35            | 11.95 | 12.40 | 12.99 | 14.40 | 6.56           | 7.16 | 7.61 | 8.20 | 9.62  |
|                 | 8H   | 11.47            | 12.05 | 12.53 | 13.10 | 14.51 | 6.65           | 7.22 | 7.71 | 8.28 | 9.69  |
|                 | 12H  | 11.53            | 12.08 | 12.60 | 13.13 | 14.56 | 6.69           | 7.24 | 7.75 | 8.29 | 9.72  |
| 4H              | 2H   | 8.65             | 9.31  | 9.70  | 10.35 | 11.75 | 5.20           | 5.85 | 6.25 | 6.89 | 8.29  |
|                 | 3H   | 10.48            | 11.03 | 11.54 | 12.09 | 13.50 | 6.54           | 7.09 | 7.60 | 8.15 | 9.57  |
|                 | 4H   | 11.17            | 11.67 | 12.24 | 12.73 | 14.16 | 7.09           | 7.59 | 8.15 | 8.65 | 10.08 |
|                 | 6H   | 11.69            | 12.12 | 12.76 | 13.20 | 14.63 | 7.51           | 7.93 | 8.58 | 9.02 | 10.45 |
|                 | 8H   | 11.86            | 12.26 | 12.94 | 13.34 | 14.78 | 7.63           | 8.03 | 8.71 | 9.11 | 10.55 |
|                 | 12H  | 11.96            | 12.32 | 13.05 | 13.41 | 14.86 | 7.70           | 8.06 | 8.79 | 9.15 | 10.60 |
| 8H              | 4H   | 11.14            | 11.54 | 12.21 | 12.61 | 14.05 | 7.37           | 7.77 | 8.44 | 8.84 | 10.28 |
|                 | 6H   | 11.70            | 12.03 | 12.80 | 13.15 | 14.59 | 7.88           | 8.21 | 8.98 | 9.33 | 10.77 |
|                 | 8H   | 11.92            | 12.21 | 13.03 | 13.31 | 14.77 | 8.08           | 8.37 | 9.18 | 9.46 | 10.93 |
|                 | 12H  | 12.06            | 12.31 | 13.17 | 13.41 | 14.91 | 8.19           | 8.45 | 9.30 | 9.54 | 11.04 |
| 12H             | 4H   | 11.09            | 11.45 | 12.18 | 12.53 | 13.98 | 7.37           | 7.73 | 8.46 | 8.82 | 10.27 |
|                 | 6H   | 11.68            | 11.97 | 12.78 | 13.07 | 14.53 | 7.93           | 8.22 | 9.04 | 9.32 | 10.78 |
|                 | 8H   | 11.90            | 12.15 | 13.01 | 13.25 | 14.75 | 8.14           | 8.40 | 9.25 | 9.49 | 10.99 |