

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: P902557

Luminaire Tested: DFN2DIP-HX3F0-040D060US830-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P902557  
REPORT IS A COMBINATION OF REPORTS P900766 AND P897645  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX3F0-040D060US830-RLLONL  
Description: 3 foot, Hexagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

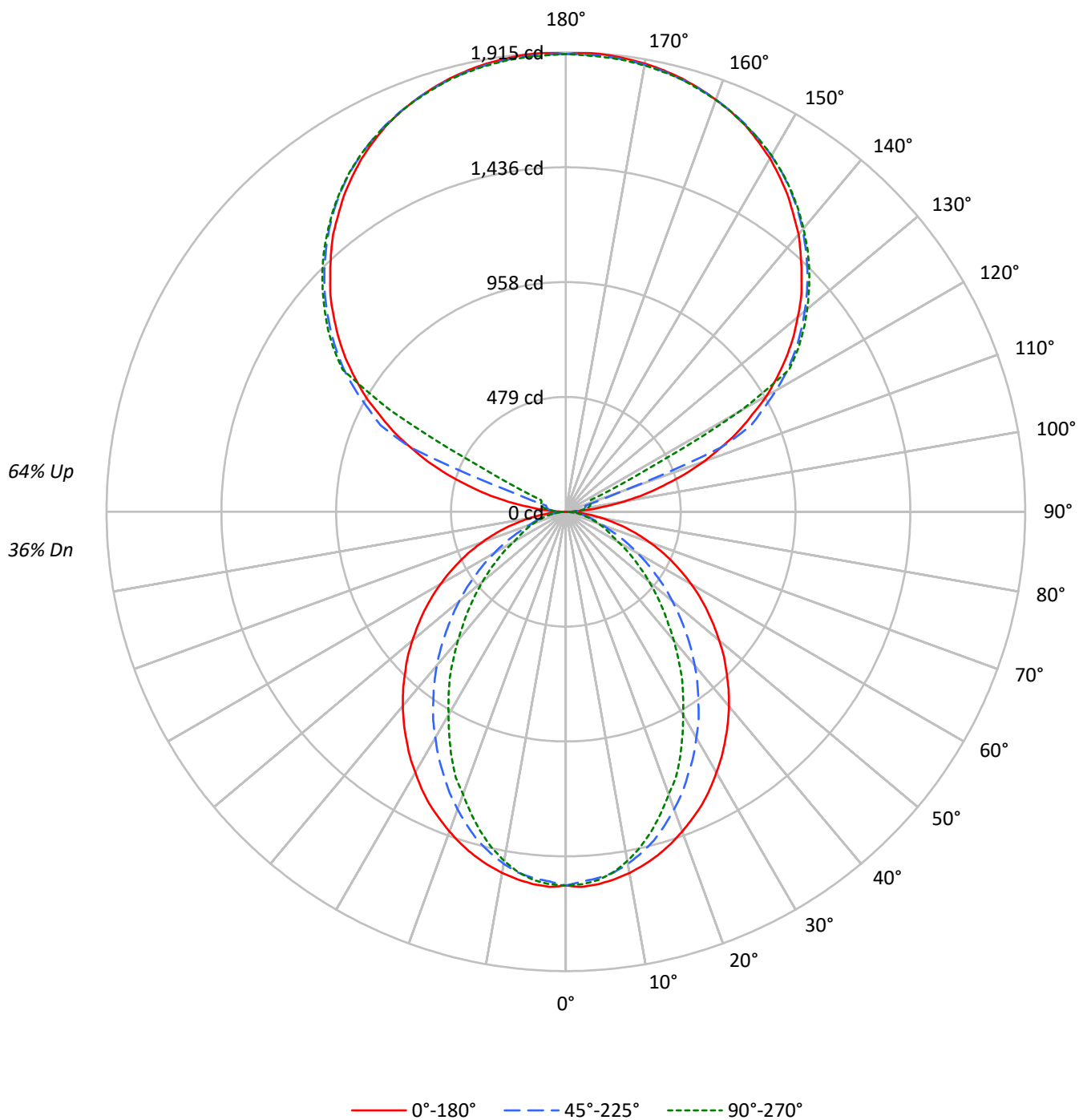
Lumens per Lamp: N/A  
Luminaire Lumens: 8803.3 lumens  
Efficiency: N/A  
Efficacy: 110.3 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 2.84' x L: 3.28' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 79.8  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9968  
Total Harmonic Distortion (THDi): 0.064  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

TEST NUMBER: P902557

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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   | 104 | 104 | 104 | 104 | 94 | 94 | 94 | 94 | 76 | 76 | 76 | 59 | 59 | 59 | 44 | 44 | 44 |
| 1   | 95  | 91  | 87  | 84  | 86 | 83 | 80 | 77 | 67 | 65 | 63 | 52 | 51 | 50 | 39 | 38 | 38 |
| 2   | 87  | 80  | 74  | 69  | 78 | 73 | 68 | 63 | 59 | 56 | 53 | 46 | 44 | 42 | 35 | 33 | 32 |
| 3   | 79  | 70  | 63  | 58  | 72 | 64 | 58 | 53 | 52 | 48 | 45 | 41 | 38 | 36 | 31 | 29 | 28 |
| 4   | 73  | 63  | 55  | 49  | 66 | 57 | 51 | 46 | 47 | 42 | 38 | 37 | 34 | 31 | 28 | 26 | 24 |
| 5   | 67  | 56  | 48  | 42  | 60 | 51 | 44 | 39 | 42 | 37 | 33 | 33 | 30 | 27 | 25 | 23 | 21 |
| 6   | 62  | 50  | 42  | 37  | 56 | 46 | 39 | 34 | 38 | 33 | 29 | 30 | 27 | 24 | 23 | 21 | 19 |
| 7   | 57  | 45  | 38  | 32  | 52 | 41 | 35 | 30 | 34 | 29 | 26 | 28 | 24 | 21 | 21 | 19 | 17 |
| 8   | 53  | 41  | 34  | 29  | 48 | 38 | 31 | 27 | 31 | 26 | 23 | 25 | 22 | 19 | 20 | 17 | 15 |
| 9   | 49  | 37  | 30  | 25  | 45 | 34 | 28 | 24 | 29 | 24 | 20 | 23 | 20 | 17 | 18 | 16 | 14 |
| 10  | 46  | 34  | 27  | 23  | 42 | 32 | 25 | 21 | 26 | 22 | 18 | 22 | 18 | 15 | 17 | 14 | 13 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1805 | 1805 | 1805 |
| 5°  | 1807 | 1775 | 1787 |
| 10° | 1788 | 1739 | 1728 |
| 15° | 1763 | 1680 | 1637 |
| 20° | 1729 | 1600 | 1526 |
| 25° | 1695 | 1510 | 1418 |
| 30° | 1650 | 1418 | 1283 |
| 35° | 1605 | 1319 | 1164 |
| 40° | 1559 | 1217 | 1027 |
| 45° | 1506 | 1104 | 904  |
| 50° | 1452 | 990  | 783  |
| 55° | 1394 | 868  | 667  |
| 60° | 1328 | 741  | 548  |
| 65° | 1252 | 611  | 492  |
| 70° | 1159 | 491  | 444  |
| 75° | 1042 | 430  | 402  |
| 80° | 873  | 357  | 345  |
| 85° | 597  | 233  | 254  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 1506 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 146.0  | 1.7       |
| 10°-20°   | 400.9  | 4.6       |
| 20°-30°   | 562.8  | 6.4       |
| 30°-40°   | 613.5  | 7.0       |
| 40°-50°   | 563.9  | 6.4       |
| 50°-60°   | 442.9  | 5.0       |
| 60°-70°   | 288.3  | 3.3       |
| 70°-80°   | 148.4  | 1.7       |
| 80°-90°   | 41.2   | 0.5       |
| 90°-100°  | 62.9   | 0.7       |
| 100°-110° | 234.6  | 2.7       |
| 110°-120° | 622.2  | 7.1       |
| 120°-130° | 1032.0 | 11.7      |
| 130°-140° | 1096.2 | 12.5      |
| 140°-150° | 1018.8 | 11.6      |
| 150°-160° | 819.1  | 9.3       |
| 160°-170° | 527.8  | 6.0       |
| 170°-180° | 181.7  | 2.1       |
| 0°-30°    | 1109.8 | 12.6      |
| 0°-40°    | 1723.3 | 19.6      |
| 0°-60°    | 2730.1 | 31.0      |
| 0°-90°    | 3208.0 | 36.4      |
| 90°-120°  | 919.8  | 10.4      |
| 90°-150°  | 4066.8 | 46.2      |
| 90°-180°  | 5595.0 | 63.6      |
| 0°-180°   | 8803.3 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1558 | 1558  | 1558 | 1558  | 1558 |      |
| 5°   | 1558 | 1551  | 1533 | 1546  | 1541 | 148  |
| 15°  | 1482 | 1466  | 1419 | 1392  | 1378 | 418  |
| 25°  | 1345 | 1300  | 1207 | 1149  | 1128 | 619  |
| 35°  | 1159 | 1087  | 963  | 874   | 843  | 726  |
| 45°  | 948  | 853   | 705  | 605   | 571  | 732  |
| 55°  | 721  | 611   | 458  | 374   | 347  | 644  |
| 65°  | 486  | 372   | 245  | 198   | 193  | 482  |
| 75°  | 259  | 161   | 113  | 103   | 102  | 274  |
| 85°  | 61   | 31    | 27   | 27    | 27   | 70   |
| 90°  | 1    | 17    | 28   | 35    | 37   | 8    |
| 95°  | 90   | 44    | 54   | 61    | 59   | 106  |
| 105° | 420  | 461   | 84   | 99    | 105  | 449  |
| 115° | 794  | 818   | 852  | 213   | 113  | 782  |
| 125° | 1123 | 1141  | 1167 | 1177  | 1181 | 1001 |
| 135° | 1389 | 1412  | 1424 | 1438  | 1435 | 1073 |
| 145° | 1612 | 1610  | 1634 | 1643  | 1636 | 1008 |
| 155° | 1775 | 1762  | 1779 | 1787  | 1776 | 818  |
| 165° | 1870 | 1862  | 1866 | 1876  | 1866 | 528  |
| 175° | 1913 | 1903  | 1906 | 1915  | 1902 | 182  |
| 180° | 1909 | 1909  | 1909 | 1909  | 1909 |      |

TEST NUMBER: P902557

CATALOG NUMBER: DFN2DIP-HX3F0-040D060US830-RLLONL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1558.2 | 1558.2 | 1558.2 | 1558.2 | 1558.2 |
| 2.5°   | 1565.3 | 1558.2 | 1542.7 | 1556.9 | 1554.0 |
| 5°     | 1558.2 | 1551.1 | 1532.8 | 1545.5 | 1541.3 |
| 7.5°   | 1545.5 | 1537.1 | 1517.4 | 1522.9 | 1515.9 |
| 10°    | 1528.6 | 1518.7 | 1490.5 | 1486.2 | 1477.9 |
| 12.5°  | 1507.5 | 1494.8 | 1456.6 | 1448.2 | 1432.7 |
| 15°    | 1482.1 | 1466.5 | 1418.6 | 1391.9 | 1377.8 |
| 17.5°  | 1452.5 | 1429.8 | 1370.6 | 1339.6 | 1317.0 |
| 20°    | 1418.6 | 1390.3 | 1319.8 | 1284.7 | 1253.6 |
| 22.5°  | 1382.0 | 1349.5 | 1267.6 | 1219.7 | 1198.7 |
| 25°    | 1345.3 | 1300.1 | 1207.0 | 1149.3 | 1128.0 |
| 27.5°  | 1301.7 | 1253.6 | 1150.7 | 1084.4 | 1051.9 |
| 30°    | 1255.1 | 1201.4 | 1088.5 | 1016.7 | 978.6  |
| 32.5°  | 1209.9 | 1145.0 | 1029.4 | 944.8  | 909.5  |
| 35°    | 1159.2 | 1087.2 | 963.2  | 874.3  | 843.2  |
| 37.5°  | 1109.8 | 1032.2 | 901.1  | 803.7  | 768.5  |
| 40°    | 1057.6 | 973.1  | 836.2  | 736.1  | 699.5  |
| 42.5°  | 1004.0 | 913.8  | 771.4  | 666.9  | 631.8  |
| 45°    | 947.6  | 853.1  | 705.1  | 604.9  | 571.1  |
| 47.5°  | 894.1  | 794.0  | 641.7  | 541.5  | 510.5  |
| 50°    | 834.8  | 734.7  | 579.6  | 482.2  | 452.7  |
| 52.5°  | 776.9  | 671.2  | 520.4  | 427.3  | 400.5  |
| 55°    | 720.6  | 610.6  | 458.3  | 373.7  | 346.9  |
| 57.5°  | 662.8  | 550.0  | 403.3  | 324.3  | 301.8  |
| 60°    | 603.5  | 490.7  | 345.4  | 273.6  | 251.1  |
| 62.5°  | 545.8  | 433.0  | 296.1  | 228.5  | 217.3  |
| 65°    | 486.5  | 372.2  | 245.3  | 197.5  | 193.1  |
| 67.5°  | 430.2  | 315.8  | 197.5  | 173.4  | 169.2  |
| 70°    | 370.9  | 260.9  | 163.5  | 149.5  | 143.7  |
| 72.5°  | 314.5  | 210.1  | 136.8  | 125.5  | 122.7  |
| 75°    | 259.4  | 160.7  | 112.8  | 102.9  | 101.6  |
| 77.5°  | 204.5  | 114.1  | 88.9   | 83.2   | 80.3   |
| 80°    | 153.6  | 81.8   | 67.6   | 62.1   | 62.1   |
| 82.5°  | 107.2  | 55.0   | 46.6   | 43.6   | 43.6   |
| 85°    | 60.6   | 31.0   | 26.8   | 26.8   | 26.8   |
| 87.5°  | 22.6   | 11.2   | 11.2   | 9.9    | 9.9    |
| 90°    | 1.3    | 16.6   | 27.5   | 34.6   | 37.2   |
| 92.5°  | 34.6   | 29.0   | 33.1   | 35.9   | 37.2   |
| 95°    | 89.7   | 44.1   | 53.8   | 60.9   | 59.4   |
| 97.5°  | 161.6  | 48.4   | 70.3   | 74.6   | 76.0   |
| 100°   | 244.5  | 55.2   | 78.7   | 89.7   | 92.5   |
| 102.5° | 335.5  | 332.9  | 81.5   | 96.6   | 100.9  |
| 105°   | 419.8  | 461.3  | 84.3   | 99.3   | 105.0  |
| 107.5° | 517.9  | 552.3  | 87.1   | 102.2  | 107.7  |
| 110°   | 611.9  | 640.7  | 241.8  | 103.7  | 109.1  |

TEST NUMBER: P902557

CATALOG NUMBER: DFN2DIP-HX3F0-040D060US830-RLLONL

**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 700.2  | 725.0  | 701.5  | 106.2  | 110.6  |
| 115°   | 794.1  | 817.6  | 852.2  | 212.7  | 113.3  |
| 117.5° | 875.5  | 903.1  | 926.7  | 729.2  | 367.3  |
| 120°   | 966.8  | 987.4  | 1012.4 | 1028.9 | 842.4  |
| 122.5° | 1044.0 | 1066.1 | 1093.8 | 1102.0 | 1103.5 |
| 125°   | 1122.8 | 1140.8 | 1167.0 | 1176.7 | 1180.7 |
| 127.5° | 1194.6 | 1213.9 | 1234.7 | 1248.5 | 1249.8 |
| 130°   | 1262.3 | 1284.4 | 1299.5 | 1314.8 | 1313.4 |
| 132.5° | 1331.3 | 1349.3 | 1364.4 | 1376.9 | 1375.5 |
| 135°   | 1389.4 | 1411.6 | 1423.8 | 1437.8 | 1434.9 |
| 137.5° | 1450.0 | 1466.6 | 1480.5 | 1494.3 | 1490.3 |
| 140°   | 1509.4 | 1520.6 | 1535.7 | 1548.1 | 1541.2 |
| 142.5° | 1559.2 | 1569.0 | 1586.9 | 1597.8 | 1590.9 |
| 145°   | 1611.7 | 1610.2 | 1633.7 | 1643.4 | 1636.5 |
| 147.5° | 1657.2 | 1653.0 | 1676.5 | 1683.4 | 1678.0 |
| 150°   | 1701.5 | 1691.8 | 1713.9 | 1722.1 | 1715.2 |
| 152.5° | 1738.7 | 1727.7 | 1748.3 | 1756.7 | 1747.0 |
| 155°   | 1774.6 | 1762.3 | 1778.9 | 1787.1 | 1776.0 |
| 157.5° | 1803.6 | 1792.6 | 1805.1 | 1814.8 | 1803.6 |
| 160°   | 1828.5 | 1820.1 | 1828.5 | 1836.7 | 1827.1 |
| 162.5° | 1850.5 | 1842.3 | 1849.2 | 1858.9 | 1846.4 |
| 165°   | 1869.9 | 1861.7 | 1865.8 | 1875.5 | 1865.8 |
| 167.5° | 1885.1 | 1876.8 | 1881.0 | 1890.7 | 1878.2 |
| 170°   | 1897.6 | 1889.2 | 1892.1 | 1901.7 | 1889.2 |
| 172.5° | 1905.8 | 1897.6 | 1900.4 | 1910.1 | 1897.6 |
| 175°   | 1912.7 | 1903.0 | 1905.8 | 1915.4 | 1901.7 |
| 177.5° | 1915.4 | 1905.8 | 1907.2 | 1916.9 | 1904.5 |
| 180°   | 1908.6 | 1908.6 | 1908.6 | 1908.6 | 1908.6 |

TEST NUMBER: P902557

CATALOG NUMBER: DFN2DIP-HX3F0-040D060US830-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 | 7.74             | 8.47  | 8.81  | 9.54  | 10.99 | 3.72           | 4.45 | 4.79 | 5.51 | 6.97  |
|                 | 3H   | 9.40             | 10.06 | 10.48 | 11.13 | 12.61 | 4.89           | 5.55 | 5.97 | 6.62 | 8.10  |
|                 | 4H   | 10.00            | 10.62 | 11.09 | 11.70 | 13.18 | 5.34           | 5.95 | 6.43 | 7.03 | 8.51  |
|                 | 6H   | 10.41            | 10.98 | 11.51 | 12.06 | 13.55 | 5.65           | 6.22 | 6.75 | 7.30 | 8.79  |
|                 | 8H   | 10.53            | 11.07 | 11.64 | 12.17 | 13.66 | 5.73           | 6.27 | 6.84 | 7.37 | 8.86  |
|                 | 12H  | 10.59            | 11.10 | 11.69 | 12.19 | 13.70 | 5.77           | 6.28 | 6.88 | 7.38 | 8.88  |
| 4H              | 2H   | 7.75             | 8.36  | 8.84  | 9.44  | 10.92 | 4.29           | 4.91 | 5.39 | 5.99 | 7.47  |
|                 | 3H   | 9.56             | 10.07 | 10.66 | 11.18 | 12.67 | 5.63           | 6.15 | 6.73 | 7.25 | 8.74  |
|                 | 4H   | 10.24            | 10.71 | 11.35 | 11.81 | 13.32 | 6.17           | 6.64 | 7.28 | 7.74 | 9.25  |
|                 | 6H   | 10.74            | 11.15 | 11.86 | 12.26 | 13.77 | 6.58           | 6.98 | 7.70 | 8.10 | 9.61  |
|                 | 8H   | 10.91            | 11.29 | 12.03 | 12.40 | 13.92 | 6.70           | 7.08 | 7.82 | 8.19 | 9.71  |
|                 | 12H  | 11.00            | 11.34 | 12.13 | 12.46 | 13.99 | 6.76           | 7.10 | 7.89 | 8.23 | 9.75  |
| 8H              | 4H   | 10.20            | 10.58 | 11.31 | 11.69 | 13.21 | 6.44           | 6.82 | 7.56 | 7.93 | 9.45  |
|                 | 6H   | 10.75            | 11.06 | 11.89 | 12.22 | 13.73 | 6.95           | 7.26 | 8.08 | 8.41 | 9.93  |
|                 | 8H   | 10.96            | 11.24 | 12.11 | 12.37 | 13.91 | 7.13           | 7.41 | 8.28 | 8.54 | 10.08 |
|                 | 12H  | 11.09            | 11.33 | 12.24 | 12.46 | 14.04 | 7.24           | 7.48 | 8.39 | 8.61 | 10.19 |
| 12H             | 4H   | 10.15            | 10.49 | 11.28 | 11.61 | 13.14 | 6.44           | 6.78 | 7.57 | 7.90 | 9.43  |
|                 | 6H   | 10.73            | 11.00 | 11.87 | 12.13 | 13.67 | 6.99           | 7.27 | 8.14 | 8.40 | 9.94  |
|                 | 8H   | 10.94            | 11.18 | 12.08 | 12.31 | 13.88 | 7.20           | 7.43 | 8.34 | 8.56 | 10.14 |