

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: P916663

Luminaire Tested: DFN2DIP-PN3F0-050D070US930-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P916663  
REPORT IS A COMBINATION OF REPORTS P901092 AND P897955  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN3F0-050D070US930-RLLONL  
Description: 3 foot, Pentagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

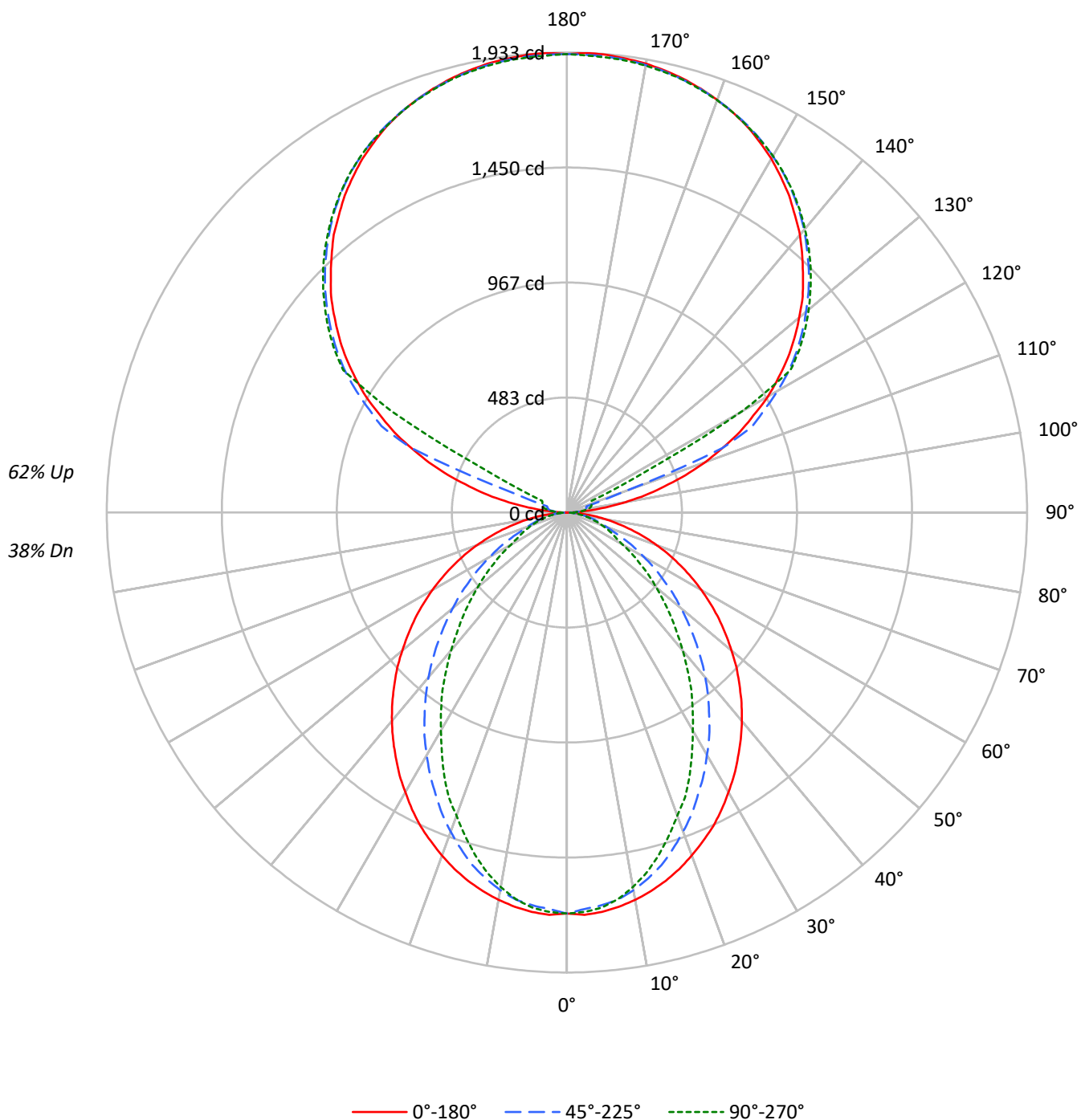
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 9115.0 lumens  
Efficiency: N/A  
Efficacy: 91.8 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 2.96' x L: 3.11' x H: 0.1')  
CIE Type: Semi-Indirect  
  
Input Watts (W): 99.3  
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   | 104 | 104 | 104 | 104 | 95 | 95 | 95 | 95 | 77 | 77 | 77 | 60 | 60 | 60 | 45 | 45 | 45 |
| 1   | 95  | 91  | 88  | 84  | 87 | 83 | 80 | 77 | 68 | 66 | 64 | 54 | 52 | 51 | 40 | 40 | 39 |
| 2   | 87  | 80  | 74  | 69  | 79 | 73 | 68 | 64 | 60 | 56 | 53 | 47 | 45 | 43 | 36 | 35 | 33 |
| 3   | 80  | 71  | 64  | 58  | 72 | 65 | 59 | 54 | 53 | 49 | 45 | 42 | 39 | 37 | 32 | 30 | 29 |
| 4   | 73  | 63  | 55  | 50  | 66 | 57 | 51 | 46 | 47 | 42 | 39 | 38 | 34 | 32 | 29 | 27 | 25 |
| 5   | 67  | 56  | 48  | 43  | 61 | 51 | 45 | 40 | 42 | 37 | 34 | 34 | 31 | 28 | 26 | 24 | 22 |
| 6   | 62  | 50  | 43  | 37  | 56 | 46 | 39 | 34 | 38 | 33 | 29 | 31 | 27 | 24 | 24 | 22 | 20 |
| 7   | 57  | 45  | 38  | 32  | 52 | 42 | 35 | 30 | 35 | 30 | 26 | 28 | 24 | 22 | 22 | 19 | 18 |
| 8   | 53  | 41  | 34  | 29  | 48 | 38 | 31 | 27 | 32 | 27 | 23 | 26 | 22 | 19 | 20 | 18 | 16 |
| 9   | 50  | 38  | 31  | 26  | 45 | 35 | 28 | 24 | 29 | 24 | 21 | 24 | 20 | 18 | 19 | 16 | 14 |
| 10  | 46  | 35  | 28  | 23  | 42 | 32 | 26 | 22 | 27 | 22 | 19 | 22 | 18 | 16 | 17 | 15 | 13 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1970 | 1970 | 1970 |
| 5°  | 1971 | 1937 | 1950 |
| 10° | 1951 | 1898 | 1885 |
| 15° | 1923 | 1833 | 1787 |
| 20° | 1886 | 1746 | 1666 |
| 25° | 1848 | 1648 | 1549 |
| 30° | 1798 | 1547 | 1401 |
| 35° | 1749 | 1439 | 1271 |
| 40° | 1699 | 1328 | 1122 |
| 45° | 1641 | 1204 | 987  |
| 50° | 1581 | 1080 | 856  |
| 55° | 1518 | 947  | 729  |
| 60° | 1445 | 808  | 599  |
| 65° | 1361 | 667  | 539  |
| 70° | 1259 | 536  | 486  |
| 75° | 1131 | 469  | 440  |
| 80° | 946  | 389  | 379  |
| 85° | 643  | 253  | 280  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 1641 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 157.9  | 1.7       |
| 10°-20°   | 433.5  | 4.8       |
| 20°-30°   | 608.6  | 6.7       |
| 30°-40°   | 663.4  | 7.3       |
| 40°-50°   | 609.7  | 6.7       |
| 50°-60°   | 478.8  | 5.3       |
| 60°-70°   | 311.7  | 3.4       |
| 70°-80°   | 160.4  | 1.8       |
| 80°-90°   | 44.3   | 0.5       |
| 90°-100°  | 63.5   | 0.7       |
| 100°-110° | 236.8  | 2.6       |
| 110°-120° | 627.9  | 6.9       |
| 120°-130° | 1041.5 | 11.4      |
| 130°-140° | 1106.3 | 12.1      |
| 140°-150° | 1028.1 | 11.3      |
| 150°-160° | 826.6  | 9.1       |
| 160°-170° | 532.6  | 5.8       |
| 170°-180° | 183.3  | 2.0       |
| 0°-30°    | 1200.0 | 13.2      |
| 0°-40°    | 1863.4 | 20.4      |
| 0°-60°    | 2951.9 | 32.4      |
| 0°-90°    | 3468.4 | 38.1      |
| 90°-120°  | 928.2  | 10.2      |
| 90°-150°  | 4104.1 | 45.0      |
| 90°-180°  | 5647.0 | 62.0      |
| 0°-180°   | 9115.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1685 | 1685  | 1685 | 1685  | 1685 |      |
| 5°   | 1685 | 1677  | 1657 | 1671  | 1667 | 160  |
| 15°  | 1602 | 1586  | 1534 | 1505  | 1490 | 452  |
| 25°  | 1455 | 1406  | 1305 | 1243  | 1220 | 669  |
| 35°  | 1253 | 1176  | 1042 | 945   | 912  | 784  |
| 45°  | 1025 | 922   | 762  | 654   | 617  | 791  |
| 55°  | 779  | 660   | 496  | 404   | 375  | 696  |
| 65°  | 526  | 402   | 265  | 214   | 209  | 521  |
| 75°  | 280  | 174   | 122  | 111   | 110  | 297  |
| 85°  | 66   | 34    | 29   | 29    | 29   | 75   |
| 90°  | 1    | 17    | 28   | 35    | 38   | 8    |
| 95°  | 90   | 44    | 54   | 61    | 60   | 107  |
| 105° | 424  | 466   | 85   | 100   | 106  | 453  |
| 115° | 801  | 825   | 860  | 215   | 114  | 789  |
| 125° | 1133 | 1151  | 1178 | 1188  | 1192 | 1010 |
| 135° | 1402 | 1424  | 1437 | 1451  | 1448 | 1083 |
| 145° | 1626 | 1625  | 1649 | 1658  | 1652 | 1017 |
| 155° | 1791 | 1778  | 1795 | 1803  | 1792 | 825  |
| 165° | 1887 | 1879  | 1883 | 1893  | 1883 | 533  |
| 175° | 1930 | 1920  | 1923 | 1933  | 1919 | 184  |
| 180° | 1926 | 1926  | 1926 | 1926  | 1926 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1684.8 | 1684.8 | 1684.8 | 1684.8 | 1684.8 |
| 2.5°   | 1692.4 | 1684.8 | 1668.0 | 1683.3 | 1680.2 |
| 5°     | 1684.8 | 1677.2 | 1657.3 | 1671.0 | 1666.6 |
| 7.5°   | 1671.0 | 1662.0 | 1640.6 | 1646.7 | 1639.0 |
| 10°    | 1652.8 | 1642.1 | 1611.7 | 1607.0 | 1597.9 |
| 12.5°  | 1629.9 | 1616.2 | 1575.0 | 1565.9 | 1549.1 |
| 15°    | 1602.5 | 1585.7 | 1533.9 | 1505.0 | 1489.7 |
| 17.5°  | 1570.4 | 1546.1 | 1482.0 | 1448.5 | 1424.0 |
| 20°    | 1533.9 | 1503.3 | 1427.1 | 1389.1 | 1355.4 |
| 22.5°  | 1494.3 | 1459.1 | 1370.7 | 1318.9 | 1296.1 |
| 25°    | 1454.6 | 1405.7 | 1305.1 | 1242.7 | 1219.7 |
| 27.5°  | 1407.4 | 1355.4 | 1244.1 | 1172.5 | 1137.4 |
| 30°    | 1357.1 | 1299.0 | 1177.0 | 1099.3 | 1058.1 |
| 32.5°  | 1308.2 | 1238.0 | 1113.1 | 1021.6 | 983.4  |
| 35°    | 1253.4 | 1175.6 | 1041.5 | 945.3  | 911.7  |
| 37.5°  | 1200.0 | 1116.1 | 974.4  | 869.0  | 831.0  |
| 40°    | 1143.5 | 1052.1 | 904.1  | 795.9  | 756.3  |
| 42.5°  | 1085.7 | 988.1  | 834.1  | 721.1  | 683.1  |
| 45°    | 1024.7 | 922.4  | 762.4  | 654.0  | 617.4  |
| 47.5°  | 966.7  | 858.5  | 693.8  | 585.5  | 552.0  |
| 50°    | 902.7  | 794.4  | 626.7  | 521.4  | 489.5  |
| 52.5°  | 840.1  | 725.7  | 562.6  | 462.0  | 433.1  |
| 55°    | 779.1  | 660.1  | 495.5  | 404.1  | 375.1  |
| 57.5°  | 716.6  | 594.7  | 436.1  | 350.7  | 326.3  |
| 60°    | 652.6  | 530.6  | 373.5  | 295.9  | 271.4  |
| 62.5°  | 590.1  | 468.1  | 320.2  | 247.0  | 234.9  |
| 65°    | 526.0  | 402.5  | 265.3  | 213.5  | 208.9  |
| 67.5°  | 465.0  | 341.5  | 213.5  | 187.5  | 183.0  |
| 70°    | 401.0  | 282.1  | 176.8  | 161.6  | 155.5  |
| 72.5°  | 340.1  | 227.1  | 147.9  | 135.7  | 132.6  |
| 75°    | 280.5  | 173.7  | 122.0  | 111.3  | 109.8  |
| 77.5°  | 221.1  | 123.4  | 96.1   | 89.9   | 86.8   |
| 80°    | 166.2  | 88.5   | 73.1   | 67.1   | 67.1   |
| 82.5°  | 115.9  | 59.5   | 50.3   | 47.2   | 47.2   |
| 85°    | 65.5   | 33.5   | 28.9   | 28.9   | 28.9   |
| 87.5°  | 24.5   | 12.1   | 12.1   | 10.7   | 10.7   |
| 90°    | 1.3    | 16.7   | 27.8   | 34.9   | 37.6   |
| 92.5°  | 34.9   | 29.3   | 33.4   | 36.3   | 37.6   |
| 95°    | 90.5   | 44.5   | 54.3   | 61.4   | 59.9   |
| 97.5°  | 163.0  | 48.8   | 71.0   | 75.3   | 76.6   |
| 100°   | 246.8  | 55.8   | 79.4   | 90.5   | 93.4   |
| 102.5° | 338.6  | 336.0  | 82.3   | 97.5   | 101.7  |
| 105°   | 423.7  | 465.5  | 85.0   | 100.3  | 105.9  |
| 107.5° | 522.6  | 557.4  | 87.9   | 103.1  | 108.8  |
| 110°   | 617.5  | 646.6  | 243.9  | 104.6  | 110.1  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 706.7  | 731.6  | 708.0  | 107.2  | 111.5  |
| 115°   | 801.4  | 825.0  | 859.9  | 214.7  | 114.4  |
| 117.5° | 883.6  | 911.4  | 935.2  | 735.8  | 370.7  |
| 120°   | 975.6  | 996.5  | 1021.7 | 1038.4 | 850.2  |
| 122.5° | 1053.5 | 1075.9 | 1103.9 | 1112.1 | 1113.6 |
| 125°   | 1133.0 | 1151.2 | 1177.7 | 1187.5 | 1191.6 |
| 127.5° | 1205.5 | 1225.0 | 1246.0 | 1260.0 | 1261.3 |
| 130°   | 1273.8 | 1296.2 | 1311.4 | 1326.8 | 1325.5 |
| 132.5° | 1343.5 | 1361.7 | 1377.0 | 1389.5 | 1388.2 |
| 135°   | 1402.1 | 1424.4 | 1436.9 | 1450.9 | 1448.1 |
| 137.5° | 1463.3 | 1480.1 | 1494.1 | 1508.1 | 1503.9 |
| 140°   | 1523.2 | 1534.5 | 1549.7 | 1562.3 | 1555.3 |
| 142.5° | 1573.5 | 1583.3 | 1601.3 | 1612.4 | 1605.5 |
| 145°   | 1626.5 | 1625.1 | 1648.7 | 1658.5 | 1651.5 |
| 147.5° | 1672.3 | 1668.3 | 1691.9 | 1698.8 | 1693.4 |
| 150°   | 1717.0 | 1707.3 | 1729.7 | 1737.9 | 1731.0 |
| 152.5° | 1754.6 | 1743.5 | 1764.4 | 1772.8 | 1763.1 |
| 155°   | 1790.9 | 1778.4 | 1795.1 | 1803.4 | 1792.4 |
| 157.5° | 1820.2 | 1809.1 | 1821.6 | 1831.4 | 1820.2 |
| 160°   | 1845.3 | 1836.9 | 1845.3 | 1853.6 | 1843.8 |
| 162.5° | 1867.5 | 1859.2 | 1866.1 | 1875.9 | 1863.4 |
| 165°   | 1887.0 | 1878.8 | 1882.8 | 1892.6 | 1882.8 |
| 167.5° | 1902.4 | 1893.9 | 1898.3 | 1908.0 | 1895.5 |
| 170°   | 1915.0 | 1906.6 | 1909.3 | 1919.1 | 1906.6 |
| 172.5° | 1923.3 | 1915.0 | 1917.8 | 1927.5 | 1915.0 |
| 175°   | 1930.2 | 1920.4 | 1923.3 | 1933.0 | 1919.1 |
| 177.5° | 1933.0 | 1923.3 | 1924.8 | 1934.5 | 1921.9 |
| 180°   | 1926.1 | 1926.1 | 1926.1 | 1926.1 | 1926.1 |

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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 | 8.23             | 8.98  | 9.29  | 10.03 | 11.47 | 4.20           | 4.94 | 5.26 | 6.00 | 7.43  |
|                 | 3H   | 9.90             | 10.56 | 10.97 | 11.63 | 13.08 | 5.38           | 6.04 | 6.45 | 7.11 | 8.56  |
|                 | 4H   | 10.50            | 11.13 | 11.58 | 12.20 | 13.66 | 5.82           | 6.45 | 6.90 | 7.52 | 8.98  |
|                 | 6H   | 10.91            | 11.49 | 12.00 | 12.56 | 14.03 | 6.13           | 6.71 | 7.22 | 7.78 | 9.25  |
|                 | 8H   | 11.03            | 11.58 | 12.13 | 12.67 | 14.14 | 6.21           | 6.76 | 7.31 | 7.85 | 9.32  |
|                 | 12H  | 11.09            | 11.61 | 12.19 | 12.69 | 14.18 | 6.25           | 6.77 | 7.35 | 7.86 | 9.34  |
| 4H              | 2H   | 8.24             | 8.87  | 9.33  | 9.94  | 11.40 | 4.78           | 5.41 | 5.87 | 6.48 | 7.94  |
|                 | 3H   | 10.05            | 10.58 | 11.15 | 11.67 | 13.15 | 6.12           | 6.64 | 7.21 | 7.74 | 9.21  |
|                 | 4H   | 10.74            | 11.22 | 11.84 | 12.30 | 13.80 | 6.66           | 7.14 | 7.75 | 8.22 | 9.72  |
|                 | 6H   | 11.24            | 11.65 | 12.35 | 12.76 | 14.25 | 7.06           | 7.47 | 8.17 | 8.58 | 10.07 |
|                 | 8H   | 11.41            | 11.80 | 12.52 | 12.90 | 14.40 | 7.19           | 7.57 | 8.29 | 8.67 | 10.17 |
|                 | 12H  | 11.50            | 11.85 | 12.62 | 12.96 | 14.47 | 7.24           | 7.59 | 8.37 | 8.71 | 10.21 |
| 8H              | 4H   | 10.70            | 11.08 | 11.80 | 12.18 | 13.68 | 6.93           | 7.31 | 8.03 | 8.41 | 9.91  |
|                 | 6H   | 11.25            | 11.57 | 12.38 | 12.71 | 14.21 | 7.43           | 7.75 | 8.56 | 8.89 | 10.39 |
|                 | 8H   | 11.47            | 11.74 | 12.60 | 12.87 | 14.39 | 7.62           | 7.89 | 8.75 | 9.02 | 10.54 |
|                 | 12H  | 11.60            | 11.84 | 12.73 | 12.96 | 14.52 | 7.73           | 7.97 | 8.87 | 9.09 | 10.65 |
| 12H             | 4H   | 10.65            | 10.99 | 11.77 | 12.11 | 13.61 | 6.93           | 7.27 | 8.05 | 8.39 | 9.89  |
|                 | 6H   | 11.23            | 11.51 | 12.36 | 12.63 | 14.15 | 7.48           | 7.76 | 8.61 | 8.88 | 10.40 |
|                 | 8H   | 11.44            | 11.68 | 12.58 | 12.80 | 14.36 | 7.68           | 7.92 | 8.82 | 9.04 | 10.60 |