

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: P912737

Luminaire Tested: DFN2DIP-TR4F0-040D060US850-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P912737  
REPORT IS A COMBINATION OF REPORTS P901926 AND P898849  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-TR4F0-040D060US850-RLLONL  
Description: 4 foot, Triangle Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

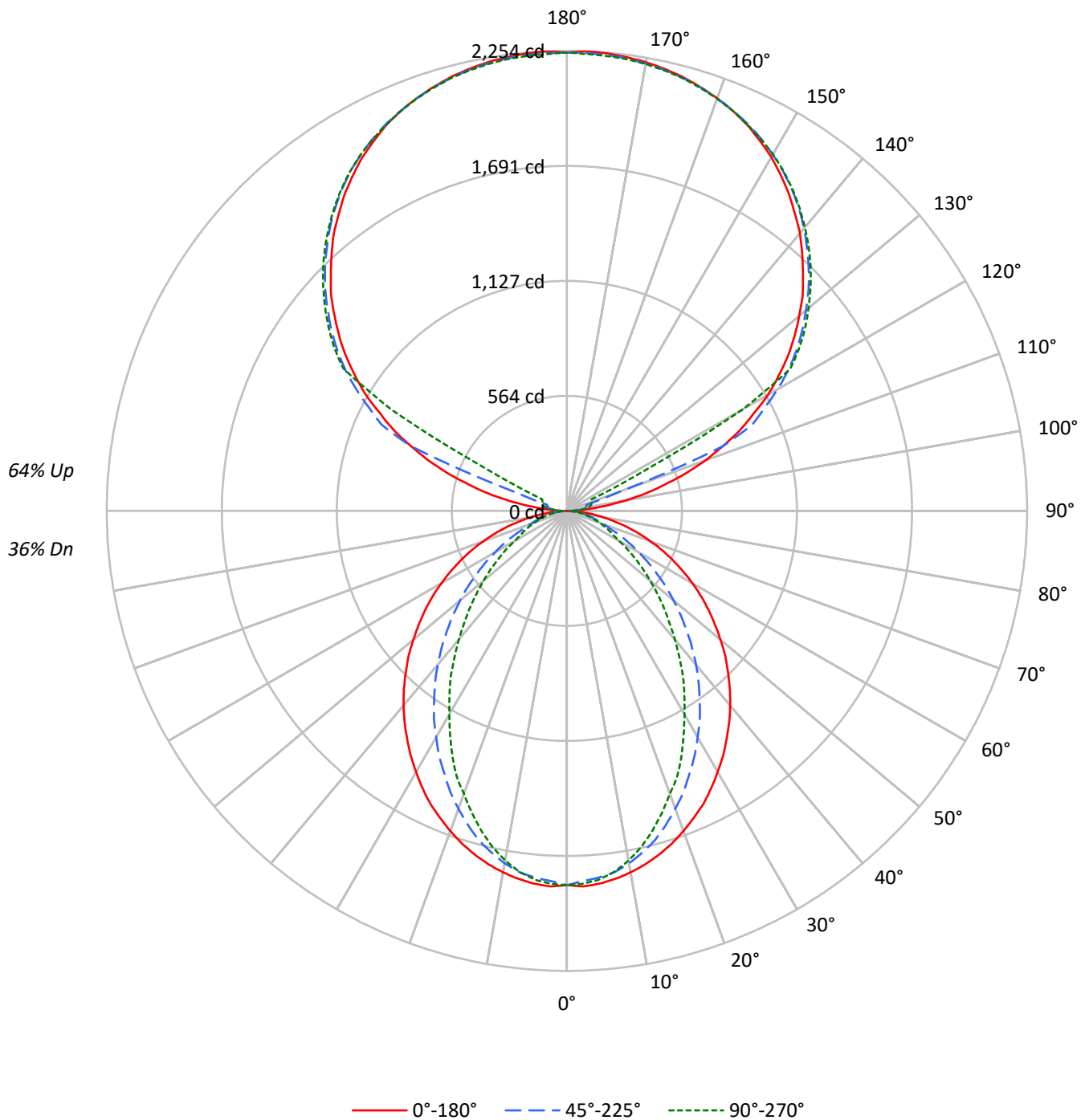
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 10358.0 lumens  
Efficiency: N/A  
Efficacy: 135.0 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.43' x L: 3.96' x H: 0.1')  
CIE Type: Semi-Indirect  
  
Input Watts (W): 76.7  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9952  
Total Harmonic Distortion (THDi): 0.069  
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 | 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°  | 1457 | 1457 | 1457 |
| 5°  | 1459 | 1433 | 1443 |
| 10° | 1444 | 1405 | 1396 |
| 15° | 1425 | 1359 | 1323 |
| 20° | 1398 | 1295 | 1234 |
| 25° | 1371 | 1223 | 1148 |
| 30° | 1335 | 1149 | 1039 |
| 35° | 1300 | 1070 | 943  |
| 40° | 1264 | 988  | 833  |
| 45° | 1222 | 897  | 733  |
| 50° | 1178 | 806  | 636  |
| 55° | 1133 | 708  | 543  |
| 60° | 1081 | 605  | 447  |
| 65° | 1021 | 501  | 402  |
| 70° | 948  | 404  | 364  |
| 75° | 856  | 356  | 331  |
| 80° | 723  | 299  | 287  |
| 85° | 504  | 199  | 215  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 1222 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 171.8   | 1.7       |
| 10°-20°   | 471.7   | 4.6       |
| 20°-30°   | 662.3   | 6.4       |
| 30°-40°   | 721.9   | 7.0       |
| 40°-50°   | 663.5   | 6.4       |
| 50°-60°   | 521.1   | 5.0       |
| 60°-70°   | 339.2   | 3.3       |
| 70°-80°   | 174.6   | 1.7       |
| 80°-90°   | 48.5    | 0.5       |
| 90°-100°  | 74.1    | 0.7       |
| 100°-110° | 276.0   | 2.7       |
| 110°-120° | 732.1   | 7.1       |
| 120°-130° | 1214.2  | 11.7      |
| 130°-140° | 1289.8  | 12.5      |
| 140°-150° | 1198.7  | 11.6      |
| 150°-160° | 963.8   | 9.3       |
| 160°-170° | 621.0   | 6.0       |
| 170°-180° | 213.7   | 2.1       |
| 0°-30°    | 1305.8  | 12.6      |
| 0°-40°    | 2027.7  | 19.6      |
| 0°-60°    | 3212.2  | 31.0      |
| 0°-90°    | 3774.5  | 36.4      |
| 90°-120°  | 1082.2  | 10.4      |
| 90°-150°  | 4785.0  | 46.2      |
| 90°-180°  | 6583.0  | 63.6      |
| 0°-180°   | 10358.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1833 | 1833  | 1833 | 1833  | 1833 |      |
| 5°   | 1833 | 1825  | 1804 | 1818  | 1814 | 174  |
| 15°  | 1744 | 1726  | 1669 | 1638  | 1621 | 491  |
| 25°  | 1583 | 1530  | 1420 | 1352  | 1327 | 728  |
| 35°  | 1364 | 1279  | 1133 | 1029  | 992  | 854  |
| 45°  | 1115 | 1004  | 830  | 712   | 672  | 861  |
| 55°  | 848  | 718   | 539  | 440   | 408  | 758  |
| 65°  | 572  | 438   | 289  | 232   | 227  | 568  |
| 75°  | 305  | 189   | 133  | 121   | 120  | 323  |
| 85°  | 71   | 36    | 32   | 32    | 32   | 82   |
| 90°  | 2    | 20    | 32   | 41    | 44   | 10   |
| 95°  | 106  | 52    | 63   | 72    | 70   | 125  |
| 105° | 494  | 543   | 99   | 117   | 124  | 528  |
| 115° | 934  | 962   | 1003 | 250   | 133  | 920  |
| 125° | 1321 | 1342  | 1373 | 1384  | 1389 | 1178 |
| 135° | 1635 | 1661  | 1675 | 1692  | 1688 | 1263 |
| 145° | 1896 | 1895  | 1922 | 1934  | 1926 | 1186 |
| 155° | 2088 | 2074  | 2093 | 2103  | 2090 | 962  |
| 165° | 2200 | 2190  | 2195 | 2207  | 2195 | 622  |
| 175° | 2250 | 2239  | 2242 | 2254  | 2238 | 214  |
| 180° | 2246 | 2246  | 2246 | 2246  | 2246 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1833.4 | 1833.4 | 1833.4 | 1833.4 | 1833.4 |
| 2.5°   | 1841.7 | 1833.4 | 1815.1 | 1831.8 | 1828.4 |
| 5°     | 1833.4 | 1825.1 | 1803.5 | 1818.4 | 1813.5 |
| 7.5°   | 1818.4 | 1808.6 | 1785.4 | 1791.8 | 1783.6 |
| 10°    | 1798.6 | 1786.9 | 1753.8 | 1748.7 | 1738.9 |
| 12.5°  | 1773.7 | 1758.8 | 1713.8 | 1704.0 | 1685.7 |
| 15°    | 1743.8 | 1725.5 | 1669.2 | 1637.7 | 1621.1 |
| 17.5°  | 1709.0 | 1682.4 | 1612.6 | 1576.2 | 1549.6 |
| 20°    | 1669.2 | 1635.9 | 1552.9 | 1511.6 | 1475.0 |
| 22.5°  | 1626.0 | 1587.9 | 1491.5 | 1435.2 | 1410.4 |
| 25°    | 1582.9 | 1529.8 | 1420.2 | 1352.3 | 1327.3 |
| 27.5°  | 1531.5 | 1475.0 | 1353.9 | 1275.9 | 1237.6 |
| 30°    | 1476.7 | 1413.5 | 1280.8 | 1196.3 | 1151.5 |
| 32.5°  | 1423.6 | 1347.2 | 1211.2 | 1111.7 | 1070.1 |
| 35°    | 1364.0 | 1279.2 | 1133.3 | 1028.7 | 992.1  |
| 37.5°  | 1305.8 | 1214.5 | 1060.2 | 945.6  | 904.3  |
| 40°    | 1244.4 | 1144.9 | 983.9  | 866.1  | 823.0  |
| 42.5°  | 1181.3 | 1075.2 | 907.6  | 784.7  | 743.4  |
| 45°    | 1115.0 | 1003.8 | 829.6  | 711.8  | 671.9  |
| 47.5°  | 1052.0 | 934.2  | 755.0  | 637.1  | 600.6  |
| 50°    | 982.2  | 864.5  | 681.9  | 567.4  | 532.7  |
| 52.5°  | 914.1  | 789.7  | 612.3  | 502.7  | 471.2  |
| 55°    | 847.8  | 718.4  | 539.2  | 439.7  | 408.2  |
| 57.5°  | 779.8  | 647.1  | 474.5  | 381.6  | 355.1  |
| 60°    | 710.1  | 577.3  | 406.4  | 321.9  | 295.4  |
| 62.5°  | 642.2  | 509.5  | 348.3  | 268.8  | 255.6  |
| 65°    | 572.5  | 437.9  | 288.7  | 232.3  | 227.2  |
| 67.5°  | 506.1  | 371.6  | 232.3  | 204.1  | 199.1  |
| 70°    | 436.4  | 307.0  | 192.4  | 175.9  | 169.1  |
| 72.5°  | 370.1  | 247.2  | 160.9  | 147.7  | 144.4  |
| 75°    | 305.2  | 189.1  | 132.7  | 121.1  | 119.6  |
| 77.5°  | 240.7  | 134.3  | 104.6  | 97.9   | 94.5   |
| 80°    | 180.8  | 96.3   | 79.5   | 73.1   | 73.1   |
| 82.5°  | 126.1  | 64.8   | 54.8   | 51.3   | 51.3   |
| 85°    | 71.3   | 36.5   | 31.5   | 31.5   | 31.5   |
| 87.5°  | 26.6   | 13.2   | 13.2   | 11.6   | 11.6   |
| 90°    | 1.6    | 19.5   | 32.4   | 40.7   | 43.8   |
| 92.5°  | 40.7   | 34.2   | 38.9   | 42.3   | 43.8   |
| 95°    | 105.6  | 51.9   | 63.3   | 71.6   | 69.9   |
| 97.5°  | 190.1  | 56.9   | 82.7   | 87.8   | 89.4   |
| 100°   | 287.7  | 65.0   | 92.6   | 105.6  | 108.8  |
| 102.5° | 394.8  | 391.7  | 95.9   | 113.7  | 118.7  |
| 105°   | 493.9  | 542.7  | 99.1   | 116.9  | 123.5  |
| 107.5° | 609.4  | 649.9  | 102.5  | 120.2  | 126.8  |
| 110°   | 720.0  | 753.9  | 284.5  | 122.0  | 128.3  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 823.9  | 853.0  | 825.4  | 125.0  | 130.1  |
| 115°   | 934.3  | 961.9  | 1002.6 | 250.3  | 133.3  |
| 117.5° | 1030.2 | 1062.6 | 1090.4 | 857.9  | 432.2  |
| 120°   | 1137.5 | 1161.8 | 1191.2 | 1210.6 | 991.2  |
| 122.5° | 1228.3 | 1254.4 | 1287.0 | 1296.6 | 1298.4 |
| 125°   | 1321.0 | 1342.2 | 1373.1 | 1384.5 | 1389.2 |
| 127.5° | 1405.5 | 1428.3 | 1452.8 | 1469.0 | 1470.5 |
| 130°   | 1485.2 | 1511.2 | 1529.0 | 1546.9 | 1545.4 |
| 132.5° | 1566.5 | 1587.6 | 1605.4 | 1620.0 | 1618.5 |
| 135°   | 1634.8 | 1660.8 | 1675.3 | 1691.7 | 1688.3 |
| 137.5° | 1706.1 | 1725.6 | 1742.0 | 1758.2 | 1753.4 |
| 140°   | 1776.0 | 1789.1 | 1806.9 | 1821.5 | 1813.4 |
| 142.5° | 1834.6 | 1846.0 | 1867.1 | 1880.0 | 1871.9 |
| 145°   | 1896.4 | 1894.6 | 1922.2 | 1933.7 | 1925.6 |
| 147.5° | 1949.8 | 1945.0 | 1972.6 | 1980.7 | 1974.4 |
| 150°   | 2002.0 | 1990.5 | 2016.6 | 2026.3 | 2018.2 |
| 152.5° | 2045.8 | 2032.8 | 2057.1 | 2067.0 | 2055.5 |
| 155°   | 2088.0 | 2073.5 | 2093.0 | 2102.7 | 2089.7 |
| 157.5° | 2122.2 | 2109.2 | 2123.8 | 2135.3 | 2122.2 |
| 160°   | 2151.5 | 2141.6 | 2151.5 | 2161.1 | 2149.8 |
| 162.5° | 2177.3 | 2167.7 | 2175.7 | 2187.2 | 2172.5 |
| 165°   | 2200.1 | 2190.5 | 2195.3 | 2206.7 | 2195.3 |
| 167.5° | 2218.0 | 2208.2 | 2213.2 | 2224.7 | 2209.9 |
| 170°   | 2232.7 | 2222.9 | 2226.2 | 2237.5 | 2222.9 |
| 172.5° | 2242.4 | 2232.7 | 2236.0 | 2247.4 | 2232.7 |
| 175°   | 2250.5 | 2239.1 | 2242.4 | 2253.7 | 2237.5 |
| 177.5° | 2253.7 | 2242.4 | 2244.1 | 2255.5 | 2240.8 |
| 180°   | 2245.6 | 2245.6 | 2245.6 | 2245.6 | 2245.6 |

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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 | 7.03             | 7.76  | 8.10  | 8.83  | 10.29 | 3.01           | 3.74 | 4.08 | 4.81 | 6.26 |
|                 | 3H   | 8.70             | 9.36  | 9.78  | 10.43 | 11.91 | 4.19           | 4.84 | 5.27 | 5.92 | 7.39 |
|                 | 4H   | 9.31             | 9.93  | 10.40 | 11.00 | 12.48 | 4.64           | 5.25 | 5.73 | 6.33 | 7.81 |
|                 | 6H   | 9.72             | 10.29 | 10.82 | 11.37 | 12.87 | 4.95           | 5.52 | 6.05 | 6.60 | 8.09 |
|                 | 8H   | 9.85             | 10.39 | 10.95 | 11.49 | 12.97 | 5.04           | 5.58 | 6.14 | 6.68 | 8.16 |
|                 | 12H  | 9.91             | 10.42 | 11.01 | 11.51 | 13.02 | 5.08           | 5.59 | 6.19 | 6.69 | 8.19 |
| 4H              | 2H   | 7.04             | 7.66  | 8.14  | 8.74  | 10.22 | 3.59           | 4.21 | 4.69 | 5.29 | 6.77 |
|                 | 3H   | 8.86             | 9.37  | 9.96  | 10.48 | 11.97 | 4.93           | 5.45 | 6.04 | 6.55 | 8.04 |
|                 | 4H   | 9.55             | 10.02 | 10.66 | 11.12 | 12.63 | 5.48           | 5.95 | 6.59 | 7.05 | 8.56 |
|                 | 6H   | 10.06            | 10.46 | 11.17 | 11.58 | 13.09 | 5.89           | 6.30 | 7.01 | 7.42 | 8.92 |
|                 | 8H   | 10.23            | 10.61 | 11.35 | 11.72 | 13.24 | 6.02           | 6.40 | 7.14 | 7.51 | 9.03 |
|                 | 12H  | 10.32            | 10.66 | 11.45 | 11.79 | 13.31 | 6.08           | 6.42 | 7.21 | 7.55 | 9.07 |
| 8H              | 4H   | 9.51             | 9.89  | 10.62 | 11.00 | 12.52 | 5.75           | 6.13 | 6.87 | 7.24 | 8.76 |
|                 | 6H   | 10.07            | 10.38 | 11.21 | 11.54 | 13.05 | 6.27           | 6.58 | 7.40 | 7.73 | 9.25 |
|                 | 8H   | 10.29            | 10.56 | 11.43 | 11.69 | 13.23 | 6.46           | 6.73 | 7.60 | 7.86 | 9.40 |
|                 | 12H  | 10.42            | 10.66 | 11.57 | 11.79 | 13.37 | 6.57           | 6.81 | 7.72 | 7.94 | 9.52 |
| 12H             | 4H   | 9.46             | 9.80  | 10.59 | 10.92 | 12.45 | 5.75           | 6.09 | 6.88 | 7.22 | 8.74 |
|                 | 6H   | 10.05            | 10.32 | 11.19 | 11.45 | 12.99 | 6.31           | 6.59 | 7.46 | 7.72 | 9.26 |
|                 | 8H   | 10.26            | 10.50 | 11.41 | 11.63 | 13.21 | 6.52           | 6.76 | 7.67 | 7.89 | 9.46 |