

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: P907840

Luminaire Tested: DFN2DIP-4P4F0-070D060US840-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P907840  
REPORT IS A COMBINATION OF REPORTS P899124 AND P895967  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-4P4F0-070D060US840-RLLFLL  
Description: 4 foot, 90deg - 4way Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

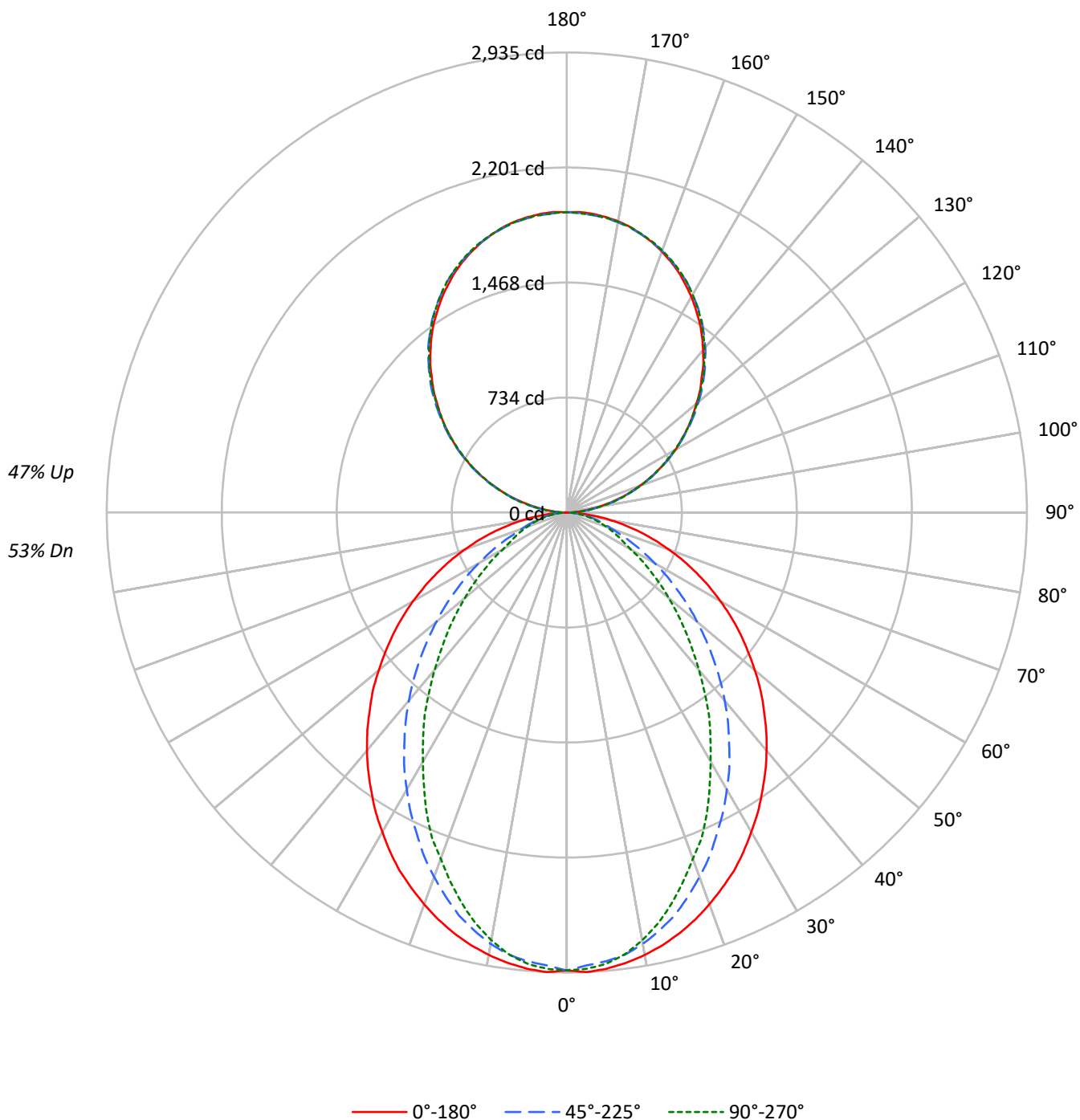
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 11371.0 lumens  
Efficiency: N/A  
Efficacy: 91.3 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 4.07' x L: 4.07' x H: 0.1')  
CIE Type: General Diffuse  
  
Input Watts (W): 124.6  
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



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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   | 108 | 108 | 108 | 108 | 100 | 100 | 100 | 100 | 85 | 85 | 85 | 71 | 71 | 71 | 59 | 59 | 59 |
| 1   | 99  | 95  | 91  | 88  | 92  | 88  | 85  | 82  | 75 | 73 | 71 | 64 | 62 | 60 | 53 | 52 | 51 |
| 2   | 91  | 83  | 77  | 72  | 84  | 78  | 72  | 68  | 67 | 63 | 59 | 56 | 54 | 51 | 47 | 45 | 43 |
| 3   | 83  | 74  | 67  | 61  | 77  | 69  | 62  | 57  | 59 | 54 | 51 | 50 | 47 | 44 | 42 | 40 | 38 |
| 4   | 76  | 66  | 58  | 52  | 70  | 61  | 54  | 49  | 53 | 48 | 44 | 45 | 41 | 38 | 38 | 35 | 33 |
| 5   | 70  | 59  | 51  | 45  | 65  | 55  | 48  | 43  | 48 | 42 | 38 | 41 | 37 | 33 | 34 | 31 | 29 |
| 6   | 65  | 53  | 45  | 39  | 60  | 50  | 42  | 37  | 43 | 38 | 33 | 37 | 33 | 30 | 31 | 28 | 26 |
| 7   | 60  | 48  | 40  | 35  | 56  | 45  | 38  | 33  | 39 | 34 | 30 | 34 | 30 | 26 | 29 | 26 | 23 |
| 8   | 56  | 44  | 36  | 31  | 52  | 41  | 34  | 29  | 36 | 30 | 27 | 31 | 27 | 24 | 27 | 23 | 21 |
| 9   | 52  | 40  | 33  | 28  | 48  | 38  | 31  | 26  | 33 | 28 | 24 | 29 | 24 | 21 | 25 | 21 | 19 |
| 10  | 49  | 37  | 30  | 25  | 45  | 35  | 28  | 24  | 31 | 25 | 22 | 27 | 22 | 19 | 23 | 20 | 17 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1895 | 1895 | 1895 |
| 5°  | 1899 | 1866 | 1878 |
| 10° | 1880 | 1830 | 1818 |
| 15° | 1854 | 1770 | 1724 |
| 20° | 1820 | 1687 | 1608 |
| 25° | 1785 | 1594 | 1497 |
| 30° | 1738 | 1499 | 1355 |
| 35° | 1692 | 1396 | 1231 |
| 40° | 1645 | 1290 | 1088 |
| 45° | 1591 | 1172 | 959  |
| 50° | 1535 | 1053 | 832  |
| 55° | 1476 | 926  | 711  |
| 60° | 1408 | 793  | 586  |
| 65° | 1330 | 657  | 528  |
| 70° | 1236 | 531  | 479  |
| 75° | 1117 | 469  | 437  |
| 80° | 945  | 396  | 382  |
| 85° | 660  | 268  | 292  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 1591 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 273.8   | 2.4       |
| 10°-20°   | 751.7   | 6.6       |
| 20°-30°   | 1055.3  | 9.3       |
| 30°-40°   | 1150.4  | 10.1      |
| 40°-50°   | 1057.3  | 9.3       |
| 50°-60°   | 830.4   | 7.3       |
| 60°-70°   | 540.5   | 4.8       |
| 70°-80°   | 278.2   | 2.4       |
| 80°-90°   | 76.5    | 0.7       |
| 90°-100°  | 118.6   | 1.0       |
| 100°-110° | 376.8   | 3.3       |
| 110°-120° | 644.8   | 5.7       |
| 120°-130° | 848.0   | 7.5       |
| 130°-140° | 951.8   | 8.4       |
| 140°-150° | 933.4   | 8.2       |
| 150°-160° | 783.0   | 6.9       |
| 160°-170° | 519.2   | 4.6       |
| 170°-180° | 181.5   | 1.6       |
| 0°-30°    | 2080.9  | 18.3      |
| 0°-40°    | 3231.2  | 28.4      |
| 0°-60°    | 5118.9  | 45.0      |
| 0°-90°    | 6014.1  | 52.9      |
| 90°-120°  | 1140.1  | 10.0      |
| 90°-150°  | 3873.3  | 34.1      |
| 90°-180°  | 5357.0  | 47.1      |
| 0°-180°   | 11371.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2922 | 2922  | 2922 | 2922  | 2922 |      |
| 5°   | 2922 | 2908  | 2874 | 2898  | 2890 | 277  |
| 15°  | 2779 | 2750  | 2660 | 2610  | 2583 | 783  |
| 25°  | 2522 | 2438  | 2263 | 2155  | 2115 | 1160 |
| 35°  | 2173 | 2038  | 1806 | 1639  | 1581 | 1360 |
| 45°  | 1777 | 1600  | 1322 | 1134  | 1071 | 1372 |
| 55°  | 1351 | 1145  | 859  | 701   | 651  | 1207 |
| 65°  | 912  | 698   | 460  | 370   | 362  | 904  |
| 75°  | 486  | 301   | 212  | 193   | 190  | 515  |
| 85°  | 114  | 58    | 50   | 50    | 50   | 130  |
| 90°  | 2    | 21    | 57   | 53    | 55   | 11   |
| 95°  | 84   | 100   | 103  | 103   | 100  | 94   |
| 105° | 348  | 352   | 356  | 359   | 359  | 367  |
| 115° | 647  | 656   | 653  | 652   | 647  | 640  |
| 125° | 941  | 956   | 951  | 946   | 944  | 841  |
| 135° | 1217 | 1235  | 1239 | 1237  | 1232 | 941  |
| 145° | 1478 | 1489  | 1499 | 1500  | 1494 | 923  |
| 155° | 1690 | 1694  | 1700 | 1708  | 1702 | 778  |
| 165° | 1838 | 1836  | 1836 | 1848  | 1840 | 519  |
| 175° | 1913 | 1908  | 1905 | 1916  | 1906 | 182  |
| 180° | 1916 | 1916  | 1916 | 1916  | 1916 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2921.6 | 2921.6 | 2921.6 | 2921.6 | 2921.6 |
| 2.5°   | 2934.8 | 2921.6 | 2892.5 | 2919.1 | 2913.8 |
| 5°     | 2921.6 | 2908.4 | 2874.0 | 2897.8 | 2889.9 |
| 7.5°   | 2897.8 | 2882.1 | 2845.1 | 2855.4 | 2842.3 |
| 10°    | 2866.1 | 2847.6 | 2794.8 | 2786.7 | 2771.0 |
| 12.5°  | 2826.5 | 2802.7 | 2731.2 | 2715.4 | 2686.2 |
| 15°    | 2778.8 | 2749.7 | 2659.9 | 2609.7 | 2583.3 |
| 17.5°  | 2723.3 | 2681.0 | 2569.9 | 2511.7 | 2469.4 |
| 20°    | 2659.9 | 2606.9 | 2474.8 | 2408.8 | 2350.5 |
| 22.5°  | 2591.2 | 2530.3 | 2376.8 | 2287.0 | 2247.6 |
| 25°    | 2522.4 | 2437.7 | 2263.2 | 2155.0 | 2115.2 |
| 27.5°  | 2440.5 | 2350.5 | 2157.5 | 2033.3 | 1972.4 |
| 30°    | 2353.3 | 2252.6 | 2041.0 | 1906.4 | 1834.9 |
| 32.5°  | 2268.6 | 2146.9 | 1930.3 | 1771.5 | 1705.3 |
| 35°    | 2173.4 | 2038.5 | 1806.0 | 1639.4 | 1581.0 |
| 37.5°  | 2080.9 | 1935.3 | 1689.6 | 1506.9 | 1441.1 |
| 40°    | 1983.0 | 1824.5 | 1567.8 | 1380.2 | 1311.4 |
| 42.5°  | 1882.6 | 1713.4 | 1446.3 | 1250.5 | 1184.7 |
| 45°    | 1776.9 | 1599.5 | 1322.1 | 1134.2 | 1070.8 |
| 47.5°  | 1676.4 | 1488.7 | 1203.2 | 1015.2 | 957.2  |
| 50°    | 1565.3 | 1377.7 | 1086.7 | 904.1  | 848.9  |
| 52.5°  | 1456.7 | 1258.4 | 975.6  | 801.1  | 750.9  |
| 55°    | 1351.0 | 1144.8 | 859.2  | 700.7  | 650.6  |
| 57.5°  | 1242.7 | 1031.2 | 756.3  | 608.1  | 565.8  |
| 60°    | 1131.7 | 920.1  | 647.7  | 513.1  | 470.7  |
| 62.5°  | 1023.3 | 811.8  | 555.1  | 428.4  | 407.3  |
| 65°    | 912.2  | 697.9  | 460.1  | 370.3  | 362.1  |
| 67.5°  | 806.5  | 592.2  | 370.3  | 325.1  | 317.3  |
| 70°    | 695.4  | 489.2  | 306.6  | 280.2  | 269.5  |
| 72.5°  | 589.7  | 393.8  | 256.4  | 235.4  | 230.0  |
| 75°    | 486.5  | 301.2  | 211.5  | 193.0  | 190.5  |
| 77.5°  | 383.4  | 214.0  | 166.6  | 155.9  | 150.7  |
| 80°    | 288.1  | 153.4  | 126.8  | 116.4  | 116.4  |
| 82.5°  | 200.9  | 103.2  | 87.3   | 81.9   | 81.9   |
| 85°    | 113.6  | 58.1   | 50.2   | 50.2   | 50.2   |
| 87.5°  | 42.3   | 21.0   | 21.0   | 18.5   | 18.5   |
| 90°    | 1.7    | 20.8   | 56.7   | 53.1   | 54.8   |
| 92.5°  | 35.9   | 48.6   | 50.3   | 52.0   | 52.0   |
| 95°    | 84.3   | 100.5  | 103.4  | 103.4  | 100.5  |
| 97.5°  | 140.4  | 155.4  | 161.8  | 161.8  | 161.8  |
| 100°   | 205.1  | 218.3  | 223.0  | 223.0  | 221.3  |
| 102.5° | 273.3  | 283.1  | 289.4  | 291.1  | 289.4  |
| 105°   | 347.8  | 352.4  | 355.9  | 358.8  | 358.8  |
| 107.5° | 421.7  | 428.7  | 428.7  | 429.8  | 421.7  |
| 110°   | 493.4  | 502.6  | 502.6  | 502.6  | 498.0  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 570.8  | 580.6  | 578.9  | 574.2  | 570.8  |
| 115°   | 647.0  | 656.3  | 653.4  | 651.7  | 647.0  |
| 117.5° | 722.8  | 735.5  | 727.3  | 722.8  | 718.1  |
| 120°   | 799.0  | 811.7  | 799.0  | 799.0  | 793.8  |
| 122.5° | 868.3  | 884.4  | 876.4  | 871.8  | 868.3  |
| 125°   | 941.1  | 955.5  | 950.9  | 945.7  | 944.0  |
| 127.5° | 1012.2 | 1030.1 | 1023.7 | 1016.8 | 1012.2 |
| 130°   | 1078.6 | 1099.4 | 1096.5 | 1093.1 | 1086.7 |
| 132.5° | 1153.2 | 1169.3 | 1170.4 | 1162.4 | 1157.7 |
| 135°   | 1217.3 | 1235.2 | 1238.6 | 1236.9 | 1232.2 |
| 137.5° | 1288.9 | 1303.3 | 1306.3 | 1305.0 | 1298.2 |
| 140°   | 1351.9 | 1366.3 | 1374.4 | 1374.4 | 1368.1 |
| 142.5° | 1416.5 | 1431.0 | 1435.6 | 1437.3 | 1431.0 |
| 145°   | 1477.8 | 1489.3 | 1498.6 | 1500.4 | 1494.0 |
| 147.5° | 1532.7 | 1547.1 | 1554.1 | 1556.9 | 1550.5 |
| 150°   | 1589.3 | 1599.1 | 1605.5 | 1610.6 | 1605.5 |
| 152.5° | 1639.5 | 1649.4 | 1657.5 | 1663.9 | 1657.5 |
| 155°   | 1689.8 | 1694.5 | 1699.6 | 1707.8 | 1702.5 |
| 157.5° | 1733.1 | 1736.7 | 1739.5 | 1751.1 | 1743.0 |
| 160°   | 1771.9 | 1775.3 | 1777.1 | 1786.9 | 1780.0 |
| 162.5° | 1807.7 | 1807.7 | 1809.4 | 1820.4 | 1812.3 |
| 165°   | 1838.3 | 1836.5 | 1836.5 | 1848.2 | 1840.1 |
| 167.5° | 1866.0 | 1860.9 | 1860.9 | 1872.4 | 1864.3 |
| 170°   | 1886.8 | 1882.2 | 1880.5 | 1892.0 | 1882.2 |
| 172.5° | 1901.3 | 1896.6 | 1894.9 | 1906.4 | 1896.6 |
| 175°   | 1912.8 | 1908.2 | 1904.7 | 1916.3 | 1906.4 |
| 177.5° | 1919.1 | 1914.6 | 1911.1 | 1920.9 | 1911.1 |
| 180°   | 1916.3 | 1916.3 | 1916.3 | 1916.3 | 1916.3 |

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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 | 9.65             | 10.51 | 10.59 | 11.46 | 12.69 | 5.61           | 6.47 | 6.55  | 7.42  | 8.65  |
|                 | 3H   | 11.34            | 12.10 | 12.29 | 13.06 | 14.32 | 6.80           | 7.57 | 7.76  | 8.53  | 9.78  |
|                 | 4H   | 11.95            | 12.67 | 12.92 | 13.64 | 14.90 | 7.26           | 7.98 | 8.22  | 8.94  | 10.21 |
|                 | 6H   | 12.38            | 13.04 | 13.35 | 14.01 | 15.29 | 7.58           | 8.25 | 8.56  | 9.22  | 10.49 |
|                 | 8H   | 12.51            | 13.14 | 13.49 | 14.13 | 15.40 | 7.67           | 8.31 | 8.66  | 9.29  | 10.57 |
|                 | 12H  | 12.57            | 13.17 | 13.56 | 14.16 | 15.45 | 7.72           | 8.32 | 8.71  | 9.30  | 10.60 |
| 4H              | 2H   | 9.67             | 10.40 | 10.64 | 11.36 | 12.63 | 6.21           | 6.94 | 7.18  | 7.90  | 9.17  |
|                 | 3H   | 11.51            | 12.11 | 12.49 | 13.11 | 14.38 | 7.57           | 8.17 | 8.55  | 9.16  | 10.44 |
|                 | 4H   | 12.21            | 12.76 | 13.20 | 13.74 | 15.05 | 8.12           | 8.67 | 9.11  | 9.66  | 10.96 |
|                 | 6H   | 12.73            | 13.20 | 13.73 | 14.21 | 15.51 | 8.54           | 9.01 | 9.54  | 10.02 | 11.32 |
|                 | 8H   | 12.91            | 13.35 | 13.91 | 14.35 | 15.67 | 8.67           | 9.11 | 9.67  | 10.12 | 11.43 |
|                 | 12H  | 13.01            | 13.41 | 14.03 | 14.43 | 15.75 | 8.74           | 9.14 | 9.76  | 10.16 | 11.48 |
| 8H              | 4H   | 12.18            | 12.62 | 13.18 | 13.62 | 14.94 | 8.40           | 8.84 | 9.41  | 9.85  | 11.16 |
|                 | 6H   | 12.75            | 13.11 | 13.78 | 14.16 | 15.47 | 8.93           | 9.29 | 9.95  | 10.34 | 11.65 |
|                 | 8H   | 12.97            | 13.29 | 14.01 | 14.33 | 15.66 | 9.12           | 9.44 | 10.15 | 10.47 | 11.80 |
|                 | 12H  | 13.12            | 13.40 | 14.15 | 14.42 | 15.80 | 9.24           | 9.52 | 10.28 | 10.55 | 11.93 |
| 12H             | 4H   | 12.13            | 12.53 | 13.15 | 13.55 | 14.87 | 8.41           | 8.81 | 9.43  | 9.83  | 11.15 |
|                 | 6H   | 12.73            | 13.05 | 13.76 | 14.08 | 15.41 | 8.98           | 9.30 | 10.01 | 10.33 | 11.66 |
|                 | 8H   | 12.95            | 13.23 | 13.99 | 14.26 | 15.64 | 9.19           | 9.47 | 10.23 | 10.50 | 11.88 |