

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: P911068

Luminaire Tested: DFN2DIP-PN2F0-030D060US850-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P911068  
REPORT IS A COMBINATION OF REPORTS P899503 AND P896349  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN2F0-030D060US850-FLLFLL  
Description: 2 foot, Pentagon Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

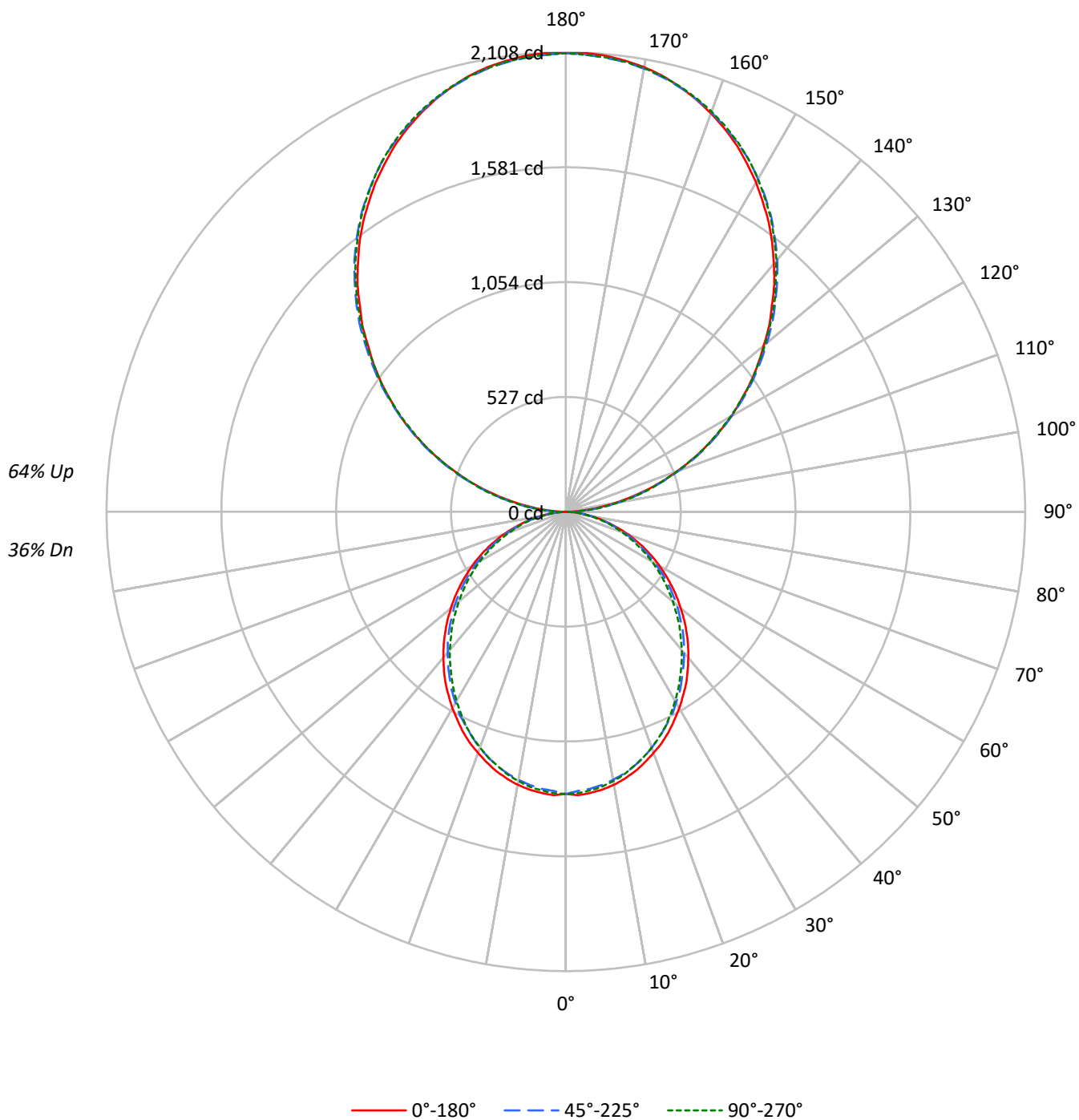
Lumens per Lamp: N/A  
Luminaire Lumens: 9182.5 lumens  
Efficiency: N/A  
Efficacy: 114.1 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 2.17' x L: 2.29' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 80.5  
Input Voltage (V): 120  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9972  
Total Harmonic Distortion (THDi): 0.128  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

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CATALOG NUMBER: DFN2DIP-PN2F0-030D060US850-FLLFLL

### Luminous Intensity Polar Plot



TEST NUMBER: P911068

CATALOG NUMBER: DFN2DIP-PN2F0-030D060US850-FLLFL

**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 | 43 | 43 | 43 |
| 1   | 95  | 90  | 87  | 83  | 85 | 82 | 79 | 76 | 66 | 64 | 62 | 52 | 50 | 49 | 38 | 37 | 36 |
| 2   | 86  | 79  | 73  | 68  | 78 | 72 | 66 | 62 | 58 | 54 | 51 | 45 | 43 | 41 | 34 | 32 | 31 |
| 3   | 79  | 69  | 62  | 56  | 71 | 63 | 57 | 52 | 51 | 47 | 43 | 40 | 37 | 34 | 30 | 28 | 26 |
| 4   | 72  | 61  | 54  | 48  | 65 | 56 | 49 | 44 | 45 | 40 | 37 | 36 | 32 | 29 | 27 | 24 | 22 |
| 5   | 66  | 54  | 47  | 41  | 59 | 50 | 43 | 38 | 40 | 35 | 31 | 32 | 28 | 25 | 24 | 22 | 20 |
| 6   | 61  | 49  | 41  | 35  | 55 | 45 | 38 | 33 | 36 | 31 | 27 | 29 | 25 | 22 | 22 | 19 | 17 |
| 7   | 56  | 44  | 36  | 31  | 50 | 40 | 33 | 28 | 33 | 28 | 24 | 26 | 22 | 20 | 20 | 17 | 15 |
| 8   | 52  | 40  | 32  | 27  | 47 | 36 | 30 | 25 | 30 | 25 | 21 | 24 | 20 | 17 | 18 | 16 | 14 |
| 9   | 48  | 36  | 29  | 24  | 44 | 33 | 27 | 22 | 27 | 22 | 19 | 22 | 18 | 16 | 17 | 14 | 12 |
| 10  | 45  | 33  | 26  | 21  | 41 | 30 | 24 | 20 | 25 | 20 | 17 | 20 | 17 | 14 | 16 | 13 | 11 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2804 | 2804 | 2804 |
| 5°  | 2804 | 2759 | 2779 |
| 10° | 2777 | 2716 | 2737 |
| 15° | 2731 | 2665 | 2675 |
| 20° | 2671 | 2597 | 2610 |
| 25° | 2612 | 2517 | 2537 |
| 30° | 2539 | 2442 | 2444 |
| 35° | 2469 | 2354 | 2347 |
| 40° | 2383 | 2265 | 2254 |
| 45° | 2298 | 2176 | 2158 |
| 50° | 2205 | 2082 | 2048 |
| 55° | 2106 | 1974 | 1946 |
| 60° | 1995 | 1846 | 1828 |
| 65° | 1873 | 1713 | 1690 |
| 70° | 1717 | 1551 | 1540 |
| 75° | 1503 | 1356 | 1396 |
| 80° | 1244 | 1107 | 1134 |
| 85° | 845  | 700  | 710  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 2835 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 121.8  | 1.3       |
| 10°-20°   | 342.8  | 3.7       |
| 20°-30°   | 503.8  | 5.5       |
| 30°-40°   | 585.2  | 6.4       |
| 40°-50°   | 584.4  | 6.4       |
| 50°-60°   | 509.6  | 5.5       |
| 60°-70°   | 376.7  | 4.1       |
| 70°-80°   | 213.1  | 2.3       |
| 80°-90°   | 62.2   | 0.7       |
| 90°-100°  | 130.2  | 1.4       |
| 100°-110° | 413.7  | 4.5       |
| 110°-120° | 708.0  | 7.7       |
| 120°-130° | 931.2  | 10.1      |
| 130°-140° | 1045.3 | 11.4      |
| 140°-150° | 1025.0 | 11.2      |
| 150°-160° | 859.8  | 9.4       |
| 160°-170° | 570.2  | 6.2       |
| 170°-180° | 199.3  | 2.2       |
| 0°-30°    | 968.5  | 10.5      |
| 0°-40°    | 1553.6 | 16.9      |
| 0°-60°    | 2647.7 | 28.8      |
| 0°-90°    | 3299.7 | 35.9      |
| 90°-120°  | 1252.0 | 13.6      |
| 90°-150°  | 4253.5 | 46.3      |
| 90°-180°  | 5883.0 | 64.1      |
| 0°-180°   | 9182.5 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1294 | 1294  | 1294 | 1294  | 1294 |      |
| 5°   | 1294 | 1290  | 1276 | 1286  | 1283 | 123  |
| 15°  | 1232 | 1225  | 1209 | 1214  | 1208 | 347  |
| 25°  | 1115 | 1106  | 1084 | 1087  | 1084 | 513  |
| 35°  | 962  | 950   | 930  | 922   | 916  | 601  |
| 45°  | 783  | 774   | 756  | 742   | 737  | 604  |
| 55°  | 593  | 585   | 570  | 555   | 549  | 530  |
| 65°  | 400  | 392   | 380  | 368   | 362  | 395  |
| 75°  | 209  | 207   | 200  | 193   | 196  | 223  |
| 85°  | 51   | 50    | 49   | 45    | 44   | 57   |
| 90°  | 2    | 23    | 62   | 58    | 60   | 9    |
| 95°  | 93   | 110   | 114  | 114   | 110  | 103  |
| 105° | 382  | 387   | 391  | 394   | 394  | 403  |
| 115° | 710  | 721   | 718  | 716   | 710  | 703  |
| 125° | 1034 | 1049  | 1044 | 1039  | 1037 | 924  |
| 135° | 1337 | 1356  | 1360 | 1358  | 1353 | 1033 |
| 145° | 1623 | 1636  | 1646 | 1648  | 1641 | 1014 |
| 155° | 1856 | 1861  | 1866 | 1875  | 1870 | 854  |
| 165° | 2019 | 2017  | 2017 | 2030  | 2021 | 569  |
| 175° | 2101 | 2096  | 2092 | 2104  | 2094 | 200  |
| 180° | 2104 | 2104  | 2104 | 2104  | 2104 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1294.5 | 1294.5 | 1294.5 | 1294.5 | 1294.5 |
| 2.5°   | 1302.1 | 1295.9 | 1282.1 | 1294.5 | 1292.2 |
| 5°     | 1294.5 | 1289.7 | 1275.9 | 1285.9 | 1283.4 |
| 7.5°   | 1285.9 | 1278.5 | 1264.7 | 1274.8 | 1272.2 |
| 10°    | 1272.2 | 1263.5 | 1248.6 | 1258.5 | 1254.8 |
| 12.5°  | 1253.5 | 1246.1 | 1231.2 | 1237.3 | 1234.9 |
| 15°    | 1232.3 | 1225.0 | 1208.7 | 1213.7 | 1207.5 |
| 17.5°  | 1206.1 | 1198.8 | 1182.5 | 1188.7 | 1182.5 |
| 20°    | 1177.5 | 1170.1 | 1152.7 | 1156.4 | 1151.5 |
| 22.5°  | 1149.0 | 1137.8 | 1121.5 | 1121.5 | 1119.0 |
| 25°    | 1115.3 | 1105.5 | 1084.3 | 1086.7 | 1084.3 |
| 27.5°  | 1077.9 | 1069.2 | 1053.1 | 1049.4 | 1043.2 |
| 30°    | 1040.7 | 1030.7 | 1012.1 | 1008.3 | 1003.3 |
| 32.5°  | 1000.9 | 993.4  | 973.5  | 965.9  | 960.9  |
| 35°    | 962.3  | 949.9  | 929.9  | 922.4  | 916.1  |
| 37.5°  | 918.7  | 907.5  | 887.5  | 878.8  | 872.6  |
| 40°    | 873.9  | 863.9  | 843.9  | 832.9  | 827.9  |
| 42.5°  | 830.3  | 820.3  | 800.5  | 787.9  | 780.5  |
| 45°    | 783.1  | 774.3  | 755.6  | 741.9  | 736.9  |
| 47.5°  | 736.9  | 728.3  | 708.3  | 694.6  | 687.1  |
| 50°    | 688.4  | 682.1  | 664.7  | 647.3  | 641.1  |
| 52.5°  | 641.1  | 632.4  | 616.3  | 602.5  | 593.8  |
| 55°    | 592.6  | 585.1  | 570.1  | 555.3  | 549.1  |
| 57.5°  | 544.0  | 537.8  | 521.6  | 506.6  | 501.6  |
| 60°    | 495.4  | 490.5  | 473.1  | 459.3  | 455.7  |
| 62.5°  | 448.1  | 439.4  | 427.0  | 414.5  | 409.6  |
| 65°    | 399.7  | 392.1  | 379.7  | 368.5  | 362.3  |
| 67.5°  | 349.9  | 343.6  | 332.4  | 323.7  | 318.7  |
| 70°    | 303.8  | 298.8  | 287.6  | 278.8  | 273.9  |
| 72.5°  | 256.5  | 251.4  | 245.2  | 236.5  | 232.9  |
| 75°    | 209.0  | 206.7  | 200.4  | 193.0  | 195.5  |
| 77.5°  | 166.8  | 161.8  | 159.3  | 155.6  | 151.9  |
| 80°    | 124.5  | 123.2  | 120.7  | 117.0  | 114.6  |
| 82.5°  | 84.6   | 84.6   | 83.5   | 78.4   | 78.4   |
| 85°    | 51.0   | 49.8   | 48.6   | 44.8   | 43.6   |
| 87.5°  | 22.4   | 20.0   | 17.4   | 13.8   | 12.4   |
| 90°    | 1.9    | 22.8   | 62.2   | 58.3   | 60.2   |
| 92.5°  | 39.4   | 53.3   | 55.2   | 57.1   | 57.1   |
| 95°    | 92.6   | 110.3  | 113.6  | 113.6  | 110.3  |
| 97.5°  | 154.2  | 170.7  | 177.7  | 177.7  | 177.7  |
| 100°   | 225.2  | 239.8  | 244.9  | 244.9  | 243.0  |
| 102.5° | 300.1  | 310.9  | 317.8  | 319.7  | 317.8  |
| 105°   | 381.9  | 387.0  | 390.8  | 394.0  | 394.0  |
| 107.5° | 463.1  | 470.8  | 470.8  | 472.0  | 463.1  |
| 110°   | 541.9  | 551.9  | 551.9  | 551.9  | 546.8  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 626.8  | 637.6  | 635.7  | 630.6  | 626.8  |
| 115°   | 710.5  | 720.7  | 717.5  | 715.6  | 710.5  |
| 117.5° | 793.7  | 807.7  | 798.7  | 793.7  | 788.6  |
| 120°   | 877.4  | 891.4  | 877.4  | 877.4  | 871.7  |
| 122.5° | 953.5  | 971.3  | 962.4  | 957.4  | 953.5  |
| 125°   | 1033.5 | 1049.3 | 1044.2 | 1038.6 | 1036.7 |
| 127.5° | 1111.6 | 1131.2 | 1124.2 | 1116.7 | 1111.6 |
| 130°   | 1184.5 | 1207.4 | 1204.2 | 1200.4 | 1193.4 |
| 132.5° | 1266.4 | 1284.1 | 1285.3 | 1276.5 | 1271.4 |
| 135°   | 1336.8 | 1356.4 | 1360.2 | 1358.3 | 1353.2 |
| 137.5° | 1415.4 | 1431.3 | 1434.5 | 1433.2 | 1425.6 |
| 140°   | 1484.6 | 1500.5 | 1509.3 | 1509.3 | 1502.4 |
| 142.5° | 1555.6 | 1571.5 | 1576.6 | 1578.4 | 1571.5 |
| 145°   | 1622.9 | 1635.6 | 1645.8 | 1647.6 | 1640.7 |
| 147.5° | 1683.1 | 1699.0 | 1706.6 | 1709.7 | 1702.8 |
| 150°   | 1745.3 | 1756.1 | 1763.1 | 1768.7 | 1763.1 |
| 152.5° | 1800.5 | 1811.3 | 1820.2 | 1827.2 | 1820.2 |
| 155°   | 1855.7 | 1860.8 | 1866.4 | 1875.4 | 1869.7 |
| 157.5° | 1903.3 | 1907.1 | 1910.3 | 1923.0 | 1914.1 |
| 160°   | 1945.9 | 1949.6 | 1951.5 | 1962.3 | 1954.7 |
| 162.5° | 1985.1 | 1985.1 | 1987.0 | 1999.1 | 1990.2 |
| 165°   | 2018.7 | 2016.8 | 2016.8 | 2029.6 | 2020.7 |
| 167.5° | 2049.2 | 2043.6 | 2043.6 | 2056.2 | 2047.3 |
| 170°   | 2072.1 | 2067.0 | 2065.1 | 2077.7 | 2067.0 |
| 172.5° | 2087.9 | 2082.8 | 2080.9 | 2093.6 | 2082.8 |
| 175°   | 2100.6 | 2095.6 | 2091.7 | 2104.4 | 2093.6 |
| 177.5° | 2107.5 | 2102.6 | 2098.7 | 2109.4 | 2098.7 |
| 180°   | 2104.4 | 2104.4 | 2104.4 | 2104.4 | 2104.4 |

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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 | 9.27             | 10.02 | 10.34 | 11.09 | 12.55 | 8.84           | 9.58  | 9.90  | 10.65 | 12.11 |
|                 | 3H   | 10.91            | 11.58 | 11.98 | 12.65 | 14.13 | 10.42          | 11.09 | 11.50 | 12.17 | 13.65 |
|                 | 4H   | 11.47            | 12.11 | 12.56 | 13.19 | 14.67 | 10.99          | 11.63 | 12.08 | 12.71 | 14.19 |
|                 | 6H   | 11.85            | 12.44 | 12.95 | 13.52 | 15.02 | 11.37          | 11.95 | 12.46 | 13.04 | 14.53 |
|                 | 8H   | 11.94            | 12.50 | 13.05 | 13.60 | 15.09 | 11.46          | 12.02 | 12.56 | 13.12 | 14.60 |
|                 | 12H  | 11.98            | 12.51 | 13.09 | 13.61 | 15.12 | 11.49          | 12.02 | 12.60 | 13.11 | 14.62 |
| 4H              | 2H   | 9.71             | 10.35 | 10.81 | 11.43 | 12.91 | 9.36           | 10.00 | 10.46 | 11.08 | 12.56 |
|                 | 3H   | 11.54            | 12.07 | 12.65 | 13.18 | 14.68 | 11.14          | 11.67 | 12.25 | 12.78 | 14.28 |
|                 | 4H   | 12.24            | 12.72 | 13.34 | 13.82 | 15.34 | 11.82          | 12.31 | 12.93 | 13.41 | 14.92 |
|                 | 6H   | 12.72            | 13.14 | 13.84 | 14.26 | 15.77 | 12.31          | 12.72 | 13.42 | 13.84 | 15.35 |
|                 | 8H   | 12.86            | 13.25 | 13.98 | 14.36 | 15.89 | 12.44          | 12.83 | 13.55 | 13.94 | 15.47 |
|                 | 12H  | 12.92            | 13.27 | 14.05 | 14.40 | 15.93 | 12.49          | 12.84 | 13.62 | 13.97 | 15.50 |
| 8H              | 4H   | 12.41            | 12.80 | 13.53 | 13.92 | 15.44 | 12.04          | 12.43 | 13.16 | 13.55 | 15.07 |
|                 | 6H   | 13.01            | 13.34 | 14.15 | 14.49 | 16.01 | 12.64          | 12.96 | 13.78 | 14.12 | 15.64 |
|                 | 8H   | 13.22            | 13.50 | 14.36 | 14.64 | 16.18 | 12.84          | 13.12 | 13.98 | 14.26 | 15.80 |
|                 | 12H  | 13.33            | 13.58 | 14.48 | 14.71 | 16.29 | 12.94          | 13.18 | 14.08 | 14.32 | 15.89 |
| 12H             | 4H   | 12.39            | 12.74 | 13.52 | 13.87 | 15.40 | 12.03          | 12.38 | 13.16 | 13.51 | 15.04 |
|                 | 6H   | 13.04            | 13.32 | 14.18 | 14.46 | 16.00 | 12.68          | 12.96 | 13.82 | 14.09 | 15.64 |
|                 | 8H   | 13.26            | 13.51 | 14.41 | 14.64 | 16.22 | 12.89          | 13.14 | 14.04 | 14.27 | 15.85 |