

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: P913500

Luminaire Tested: DFN2DIP-HX3F0-050D090US927-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P913500  
REPORT IS A COMBINATION OF REPORTS P899289 AND P896089  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX3F0-050D090US927-FLLFLL  
Description: 3 foot, Hexagon Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

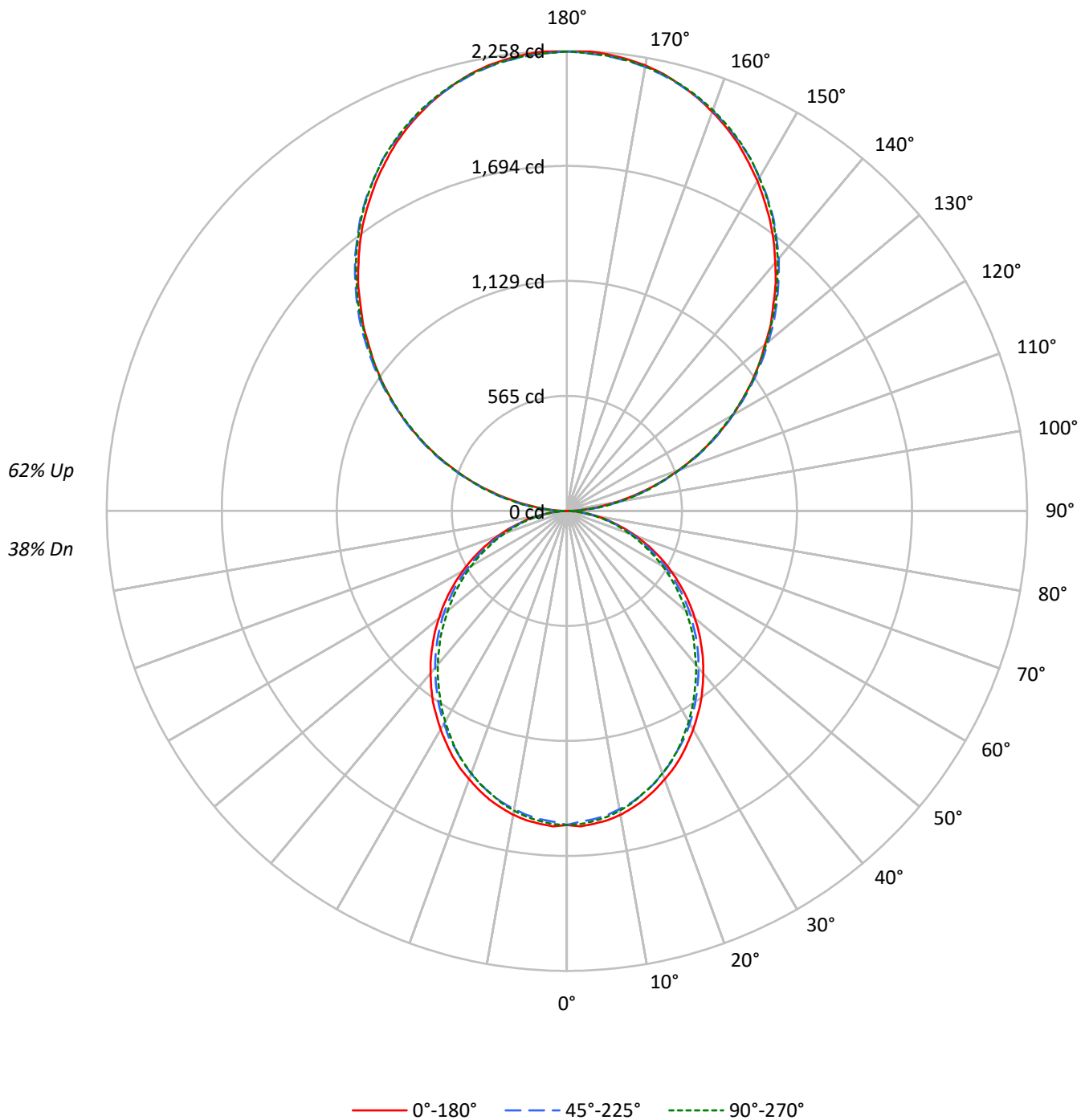
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 10231.0 lumens  
Efficiency: N/A  
Efficacy: 88.3 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 2.84' x L: 3.28' x H: 0.1')  
CIE Type: Semi-Indirect  
  
Input Watts (W): 115.9  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9951  
Total Harmonic Distortion (THDi): 0.07  
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



TEST NUMBER: P913500

CATALOG NUMBER: DFN2DIP-HX3F0-050D090US927-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 | 95 | 95 | 95 | 95 | 77 | 77 | 77 | 61 | 61 | 61 | 45 | 45 | 45 |
| 1   | 95  | 91  | 87  | 84  | 86 | 83 | 79 | 77 | 67 | 65 | 63 | 53 | 52 | 50 | 40 | 39 | 38 |
| 2   | 87  | 79  | 73  | 68  | 78 | 72 | 67 | 63 | 59 | 55 | 52 | 47 | 44 | 42 | 35 | 34 | 32 |
| 3   | 79  | 70  | 63  | 57  | 71 | 64 | 57 | 52 | 52 | 47 | 44 | 41 | 38 | 35 | 31 | 29 | 27 |
| 4   | 72  | 62  | 54  | 48  | 65 | 56 | 50 | 44 | 46 | 41 | 37 | 37 | 33 | 30 | 28 | 26 | 24 |
| 5   | 66  | 55  | 47  | 41  | 60 | 50 | 43 | 38 | 41 | 36 | 32 | 33 | 29 | 26 | 25 | 23 | 21 |
| 6   | 61  | 49  | 41  | 35  | 55 | 45 | 38 | 33 | 37 | 32 | 28 | 30 | 26 | 23 | 23 | 20 | 18 |
| 7   | 56  | 44  | 36  | 31  | 51 | 41 | 34 | 29 | 34 | 28 | 25 | 27 | 23 | 20 | 21 | 18 | 16 |
| 8   | 52  | 40  | 33  | 27  | 47 | 37 | 30 | 25 | 31 | 25 | 22 | 25 | 21 | 18 | 19 | 16 | 14 |
| 9   | 49  | 37  | 29  | 24  | 44 | 34 | 27 | 23 | 28 | 23 | 19 | 23 | 19 | 16 | 18 | 15 | 13 |
| 10  | 45  | 33  | 26  | 22  | 41 | 31 | 24 | 20 | 26 | 21 | 17 | 21 | 17 | 15 | 16 | 14 | 12 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1785 | 1785 | 1785 |
| 5°  | 1787 | 1759 | 1771 |
| 10° | 1772 | 1734 | 1746 |
| 15° | 1745 | 1704 | 1708 |
| 20° | 1709 | 1664 | 1668 |
| 25° | 1673 | 1615 | 1623 |
| 30° | 1629 | 1569 | 1566 |
| 35° | 1586 | 1516 | 1505 |
| 40° | 1534 | 1462 | 1448 |
| 45° | 1482 | 1408 | 1388 |
| 50° | 1425 | 1351 | 1320 |
| 55° | 1365 | 1285 | 1257 |
| 60° | 1298 | 1207 | 1184 |
| 65° | 1224 | 1127 | 1099 |
| 70° | 1130 | 1028 | 1007 |
| 75° | 1000 | 910  | 920  |
| 80° | 843  | 758  | 758  |
| 85° | 598  | 502  | 492  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 2123 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 145.1   | 1.4       |
| 10°-20°   | 408.1   | 4.0       |
| 20°-30°   | 599.8   | 5.9       |
| 30°-40°   | 696.6   | 6.8       |
| 40°-50°   | 695.8   | 6.8       |
| 50°-60°   | 606.7   | 5.9       |
| 60°-70°   | 448.5   | 4.4       |
| 70°-80°   | 253.7   | 2.5       |
| 80°-90°   | 73.4    | 0.7       |
| 90°-100°  | 139.5   | 1.4       |
| 100°-110° | 443.3   | 4.3       |
| 110°-120° | 758.7   | 7.4       |
| 120°-130° | 997.8   | 9.8       |
| 130°-140° | 1120.0  | 10.9      |
| 140°-150° | 1098.2  | 10.7      |
| 150°-160° | 921.3   | 9.0       |
| 160°-170° | 611.0   | 6.0       |
| 170°-180° | 213.5   | 2.1       |
| 0°-30°    | 1153.0  | 11.3      |
| 0°-40°    | 1849.6  | 18.1      |
| 0°-60°    | 3152.1  | 30.8      |
| 0°-90°    | 3927.7  | 38.4      |
| 90°-120°  | 1341.5  | 13.1      |
| 90°-150°  | 4557.5  | 44.5      |
| 90°-180°  | 6303.0  | 61.6      |
| 0°-180°   | 10231.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1541 | 1541  | 1541 | 1541  | 1541 |      |
| 5°   | 1541 | 1535  | 1519 | 1531  | 1528 | 146  |
| 15°  | 1467 | 1458  | 1439 | 1445  | 1438 | 413  |
| 25°  | 1328 | 1316  | 1291 | 1294  | 1291 | 611  |
| 35°  | 1146 | 1131  | 1107 | 1098  | 1091 | 715  |
| 45°  | 932  | 922   | 900  | 883   | 877  | 719  |
| 55°  | 706  | 697   | 679  | 661   | 654  | 631  |
| 65°  | 476  | 467   | 452  | 439   | 431  | 470  |
| 75°  | 249  | 246   | 238  | 230   | 233  | 266  |
| 85°  | 61   | 59    | 58   | 53    | 52   | 68   |
| 90°  | 2    | 24    | 67   | 62    | 65   | 10   |
| 95°  | 99   | 118   | 122  | 122   | 118  | 110  |
| 105° | 409  | 415   | 419  | 422   | 422  | 432  |
| 115° | 761  | 772   | 769  | 767   | 761  | 753  |
| 125° | 1107 | 1124  | 1119 | 1113  | 1111 | 990  |
| 135° | 1432 | 1453  | 1458 | 1455  | 1450 | 1107 |
| 145° | 1739 | 1752  | 1763 | 1765  | 1758 | 1086 |
| 155° | 1988 | 1994  | 2000 | 2009  | 2003 | 915  |
| 165° | 2163 | 2161  | 2161 | 2175  | 2165 | 610  |
| 175° | 2251 | 2245  | 2241 | 2255  | 2243 | 214  |
| 180° | 2255 | 2255  | 2255 | 2255  | 2255 |      |

TEST NUMBER: P913500

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1541.2 | 1541.2 | 1541.2 | 1541.2 | 1541.2 |
| 2.5°   | 1550.1 | 1542.8 | 1526.5 | 1541.2 | 1538.4 |
| 5°     | 1541.2 | 1535.4 | 1519.0 | 1530.8 | 1528.0 |
| 7.5°   | 1530.8 | 1522.0 | 1505.7 | 1517.7 | 1514.7 |
| 10°    | 1514.7 | 1504.3 | 1486.5 | 1498.3 | 1493.9 |
| 12.5°  | 1492.3 | 1483.5 | 1465.8 | 1473.1 | 1470.1 |
| 15°    | 1467.1 | 1458.3 | 1439.0 | 1445.0 | 1437.6 |
| 17.5°  | 1436.0 | 1427.2 | 1407.9 | 1415.2 | 1407.9 |
| 20°    | 1401.9 | 1393.1 | 1372.4 | 1376.7 | 1370.9 |
| 22.5°  | 1367.9 | 1354.6 | 1335.2 | 1335.2 | 1332.2 |
| 25°    | 1327.9 | 1316.1 | 1290.9 | 1293.7 | 1290.9 |
| 27.5°  | 1283.3 | 1273.0 | 1253.8 | 1249.3 | 1242.0 |
| 30°    | 1239.0 | 1227.1 | 1204.9 | 1200.5 | 1194.5 |
| 32.5°  | 1191.5 | 1182.7 | 1159.0 | 1150.0 | 1144.1 |
| 35°    | 1145.6 | 1130.8 | 1107.1 | 1098.1 | 1090.8 |
| 37.5°  | 1093.7 | 1080.4 | 1056.6 | 1046.2 | 1038.9 |
| 40°    | 1040.5 | 1028.5 | 1004.7 | 991.5  | 985.6  |
| 42.5°  | 988.6  | 976.6  | 953.0  | 938.0  | 929.2  |
| 45°    | 932.2  | 921.9  | 899.5  | 883.4  | 877.3  |
| 47.5°  | 877.3  | 867.0  | 843.3  | 826.9  | 818.1  |
| 50°    | 819.5  | 812.1  | 791.4  | 770.6  | 763.2  |
| 52.5°  | 763.2  | 752.8  | 733.6  | 717.3  | 706.9  |
| 55°    | 705.5  | 696.6  | 678.7  | 661.0  | 653.6  |
| 57.5°  | 647.6  | 640.2  | 620.9  | 603.2  | 597.1  |
| 60°    | 589.8  | 584.0  | 563.2  | 546.8  | 542.5  |
| 62.5°  | 533.5  | 523.2  | 508.3  | 493.5  | 487.6  |
| 65°    | 475.8  | 466.8  | 452.0  | 438.7  | 431.3  |
| 67.5°  | 416.5  | 409.0  | 395.8  | 385.4  | 379.4  |
| 70°    | 361.6  | 355.7  | 342.3  | 331.9  | 326.1  |
| 72.5°  | 305.4  | 299.4  | 292.0  | 281.6  | 277.2  |
| 75°    | 248.9  | 246.1  | 238.5  | 229.7  | 232.7  |
| 77.5°  | 198.6  | 192.6  | 189.6  | 185.2  | 180.9  |
| 80°    | 148.3  | 146.7  | 143.7  | 139.3  | 136.3  |
| 82.5°  | 100.8  | 100.8  | 99.3   | 93.4   | 93.4   |
| 85°    | 60.7   | 59.3   | 57.8   | 53.3   | 51.9   |
| 87.5°  | 26.7   | 23.8   | 20.8   | 16.3   | 14.8   |
| 90°    | 2.1    | 24.5   | 66.6   | 62.5   | 64.6   |
| 92.5°  | 42.1   | 57.1   | 59.2   | 61.2   | 61.2   |
| 95°    | 99.3   | 118.3  | 121.7  | 121.7  | 118.3  |
| 97.5°  | 165.2  | 182.8  | 190.4  | 190.4  | 190.4  |
| 100°   | 241.3  | 257.0  | 262.4  | 262.4  | 260.4  |
| 102.5° | 321.5  | 333.1  | 340.6  | 342.6  | 340.6  |
| 105°   | 409.2  | 414.6  | 418.7  | 422.2  | 422.2  |
| 107.5° | 496.2  | 504.4  | 504.4  | 505.7  | 496.2  |
| 110°   | 580.5  | 591.4  | 591.4  | 591.4  | 586.0  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 671.6  | 683.2  | 681.1  | 675.7  | 671.6  |
| 115°   | 761.4  | 772.2  | 768.8  | 766.8  | 761.4  |
| 117.5° | 850.4  | 865.4  | 855.9  | 850.4  | 844.9  |
| 120°   | 940.2  | 955.1  | 940.2  | 940.2  | 934.0  |
| 122.5° | 1021.7 | 1040.8 | 1031.3 | 1025.8 | 1021.7 |
| 125°   | 1107.4 | 1124.3 | 1119.0 | 1112.8 | 1110.8 |
| 127.5° | 1191.0 | 1212.0 | 1204.6 | 1196.4 | 1191.0 |
| 130°   | 1269.2 | 1293.6 | 1290.2 | 1286.1 | 1278.7 |
| 132.5° | 1356.8 | 1375.9 | 1377.2 | 1367.7 | 1362.3 |
| 135°   | 1432.3 | 1453.3 | 1457.5 | 1455.4 | 1450.0 |
| 137.5° | 1516.6 | 1533.6 | 1537.0 | 1535.6 | 1527.5 |
| 140°   | 1590.7 | 1607.7 | 1617.2 | 1617.2 | 1609.7 |
| 142.5° | 1666.8 | 1683.8 | 1689.2 | 1691.3 | 1683.8 |
| 145°   | 1738.9 | 1752.5 | 1763.3 | 1765.4 | 1757.9 |
| 147.5° | 1803.5 | 1820.4 | 1828.6 | 1832.0 | 1824.6 |
| 150°   | 1870.1 | 1881.7 | 1889.1 | 1895.2 | 1889.1 |
| 152.5° | 1929.2 | 1940.8 | 1950.3 | 1957.8 | 1950.3 |
| 155°   | 1988.4 | 1993.8 | 1999.9 | 2009.4 | 2003.3 |
| 157.5° | 2039.3 | 2043.4 | 2046.8 | 2060.4 | 2050.9 |
| 160°   | 2084.9 | 2089.0 | 2091.0 | 2102.5 | 2094.4 |
| 162.5° | 2127.0 | 2127.0 | 2129.1 | 2142.0 | 2132.5 |
| 165°   | 2163.1 | 2161.0 | 2161.0 | 2174.6 | 2165.1 |
| 167.5° | 2195.7 | 2189.6 | 2189.6 | 2203.1 | 2193.6 |
| 170°   | 2220.2 | 2214.7 | 2212.7 | 2226.3 | 2214.7 |
| 172.5° | 2237.1 | 2231.7 | 2229.7 | 2243.3 | 2231.7 |
| 175°   | 2250.7 | 2245.3 | 2241.2 | 2254.9 | 2243.3 |
| 177.5° | 2258.2 | 2252.8 | 2248.7 | 2260.3 | 2248.7 |
| 180°   | 2254.9 | 2254.9 | 2254.9 | 2254.9 | 2254.9 |

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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 | 8.06             | 8.83  | 9.11  | 9.88  | 11.31 | 7.63           | 8.40  | 8.68  | 9.45  | 10.88 |
|                 | 3H   | 9.71             | 10.39 | 10.77 | 11.46 | 12.90 | 9.24           | 9.92  | 10.30 | 10.99 | 12.43 |
|                 | 4H   | 10.28            | 10.93 | 11.36 | 12.00 | 13.45 | 9.82           | 10.47 | 10.89 | 11.53 | 12.99 |
|                 | 6H   | 10.67            | 11.27 | 11.75 | 12.34 | 13.81 | 10.20          | 10.80 | 11.28 | 11.87 | 13.34 |
|                 | 8H   | 10.77            | 11.34 | 11.86 | 12.43 | 13.89 | 10.30          | 10.87 | 11.39 | 11.96 | 13.42 |
|                 | 12H  | 10.81            | 11.36 | 11.90 | 12.43 | 13.92 | 10.34          | 10.88 | 11.43 | 11.96 | 13.44 |
| 4H              | 2H   | 8.51             | 9.16  | 9.59  | 10.22 | 11.68 | 8.16           | 8.82  | 9.24  | 9.88  | 11.34 |
|                 | 3H   | 10.36            | 10.90 | 11.44 | 11.99 | 13.46 | 9.97           | 10.51 | 11.05 | 11.60 | 13.07 |
|                 | 4H   | 11.06            | 11.56 | 12.15 | 12.64 | 14.13 | 10.66          | 11.16 | 11.75 | 12.24 | 13.73 |
|                 | 6H   | 11.56            | 11.99 | 12.66 | 13.10 | 14.58 | 11.16          | 11.59 | 12.26 | 12.69 | 14.17 |
|                 | 8H   | 11.71            | 12.11 | 12.81 | 13.20 | 14.70 | 11.30          | 11.70 | 12.40 | 12.80 | 14.29 |
|                 | 12H  | 11.77            | 12.13 | 12.89 | 13.24 | 14.75 | 11.35          | 11.72 | 12.47 | 12.83 | 14.33 |
| 8H              | 4H   | 11.25            | 11.65 | 12.35 | 12.74 | 14.24 | 10.89          | 11.29 | 11.99 | 12.39 | 13.88 |
|                 | 6H   | 11.86            | 12.19 | 12.99 | 13.33 | 14.83 | 11.50          | 11.83 | 12.63 | 12.98 | 14.47 |
|                 | 8H   | 12.08            | 12.37 | 13.21 | 13.49 | 15.00 | 11.71          | 12.00 | 12.84 | 13.12 | 14.64 |
|                 | 12H  | 12.20            | 12.45 | 13.33 | 13.57 | 15.12 | 11.82          | 12.08 | 12.95 | 13.19 | 14.74 |
| 12H             | 4H   | 11.23            | 11.59 | 12.34 | 12.70 | 14.20 | 10.88          | 11.24 | 11.99 | 12.35 | 13.85 |
|                 | 6H   | 11.89            | 12.18 | 13.02 | 13.30 | 14.82 | 11.54          | 11.83 | 12.67 | 12.95 | 14.47 |
|                 | 8H   | 12.12            | 12.38 | 13.25 | 13.50 | 15.05 | 11.77          | 12.02 | 12.90 | 13.14 | 14.69 |