

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: P924186

Luminaire Tested: DFN2DIP-4P4F0-060D070US950-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P924186  
REPORT IS A COMBINATION OF REPORTS P899133 AND P895967  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-4P4F0-060D070US950-FLLFLL  
Description: 4 foot, 90deg - 4way Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

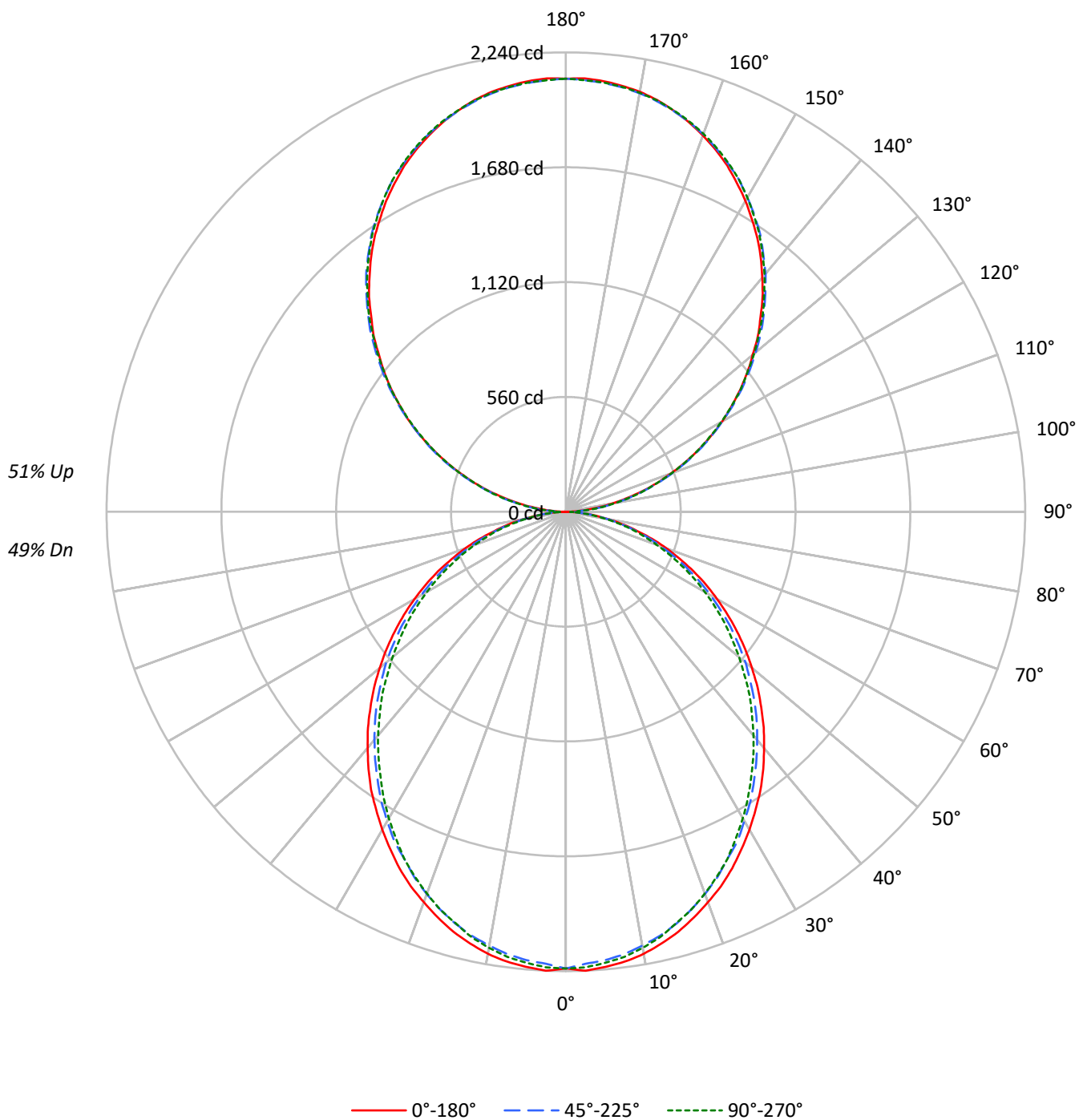
Lumens per Lamp: N/A  
Luminaire Lumens: 11576.8 lumens  
Efficiency: N/A  
Efficacy: 94.4 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 4.07' x L: 4.07' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 122.6  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9933  
Total Harmonic Distortion (THDi): 0.066  
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   | 107 | 107 | 107 | 107 | 98 | 98 | 98 | 98 | 83 | 83 | 83 | 68 | 68 | 68 | 55 | 55 | 55 |
| 1   | 98  | 93  | 89  | 86  | 90 | 86 | 83 | 80 | 73 | 70 | 68 | 60 | 59 | 57 | 49 | 48 | 47 |
| 2   | 89  | 81  | 75  | 70  | 82 | 75 | 70 | 65 | 64 | 60 | 56 | 53 | 50 | 48 | 43 | 41 | 39 |
| 3   | 81  | 72  | 64  | 58  | 74 | 66 | 60 | 55 | 56 | 51 | 47 | 47 | 43 | 40 | 38 | 36 | 33 |
| 4   | 74  | 63  | 55  | 49  | 68 | 59 | 52 | 46 | 50 | 45 | 40 | 42 | 38 | 34 | 34 | 31 | 29 |
| 5   | 68  | 56  | 48  | 42  | 62 | 52 | 45 | 40 | 45 | 39 | 35 | 37 | 33 | 30 | 31 | 28 | 25 |
| 6   | 63  | 51  | 43  | 37  | 58 | 47 | 40 | 35 | 40 | 35 | 30 | 34 | 29 | 26 | 28 | 25 | 22 |
| 7   | 58  | 46  | 38  | 32  | 53 | 42 | 35 | 30 | 36 | 31 | 27 | 31 | 26 | 23 | 25 | 22 | 20 |
| 8   | 54  | 41  | 34  | 28  | 49 | 39 | 32 | 27 | 33 | 28 | 24 | 28 | 24 | 21 | 23 | 20 | 18 |
| 9   | 50  | 38  | 30  | 25  | 46 | 35 | 29 | 24 | 30 | 25 | 21 | 26 | 22 | 19 | 22 | 18 | 16 |
| 10  | 47  | 35  | 28  | 23  | 43 | 32 | 26 | 22 | 28 | 23 | 19 | 24 | 20 | 17 | 20 | 17 | 14 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1445 | 1445 | 1445 |
| 5°  | 1447 | 1425 | 1435 |
| 10° | 1436 | 1406 | 1416 |
| 15° | 1415 | 1384 | 1386 |
| 20° | 1386 | 1352 | 1356 |
| 25° | 1358 | 1314 | 1320 |
| 30° | 1323 | 1279 | 1275 |
| 35° | 1289 | 1237 | 1227 |
| 40° | 1248 | 1195 | 1182 |
| 45° | 1206 | 1153 | 1135 |
| 50° | 1161 | 1108 | 1081 |
| 55° | 1114 | 1057 | 1032 |
| 60° | 1061 | 996  | 976  |
| 65° | 1003 | 933  | 909  |
| 70° | 929  | 856  | 837  |
| 75° | 826  | 765  | 772  |
| 80° | 703  | 648  | 646  |
| 85° | 510  | 445  | 436  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 1599 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 209.6   | 1.8       |
| 10°-20°   | 589.8   | 5.1       |
| 20°-30°   | 866.8   | 7.5       |
| 30°-40°   | 1006.7  | 8.7       |
| 40°-50°   | 1005.5  | 8.7       |
| 50°-60°   | 876.7   | 7.6       |
| 60°-70°   | 648.1   | 5.6       |
| 70°-80°   | 366.7   | 3.2       |
| 80°-90°   | 102.8   | 0.9       |
| 90°-100°  | 130.7   | 1.1       |
| 100°-110° | 415.3   | 3.6       |
| 110°-120° | 710.6   | 6.1       |
| 120°-130° | 934.6   | 8.1       |
| 130°-140° | 1049.0  | 9.1       |
| 140°-150° | 1028.7  | 8.9       |
| 150°-160° | 862.9   | 7.5       |
| 160°-170° | 572.3   | 4.9       |
| 170°-180° | 200.0   | 1.7       |
| 0°-30°    | 1666.2  | 14.4      |
| 0°-40°    | 2673.0  | 23.1      |
| 0°-60°    | 4555.2  | 39.3      |
| 0°-90°    | 5672.8  | 49.0      |
| 90°-120°  | 1256.6  | 10.9      |
| 90°-150°  | 4268.9  | 36.9      |
| 90°-180°  | 5904.0  | 51.0      |
| 0°-180°   | 11576.8 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2227 | 2227  | 2227 | 2227  | 2227 |      |
| 5°   | 2227 | 2219  | 2195 | 2212  | 2208 | 211  |
| 15°  | 2120 | 2108  | 2080 | 2088  | 2078 | 597  |
| 25°  | 1919 | 1902  | 1866 | 1870  | 1866 | 883  |
| 35°  | 1656 | 1634  | 1600 | 1587  | 1576 | 1034 |
| 45°  | 1347 | 1332  | 1300 | 1276  | 1268 | 1040 |
| 55°  | 1020 | 1007  | 981  | 955   | 945  | 912  |
| 65°  | 688  | 675   | 653  | 634   | 623  | 680  |
| 75°  | 360  | 356   | 345  | 332   | 336  | 384  |
| 85°  | 88   | 86    | 84   | 77    | 75   | 98   |
| 90°  | 2    | 23    | 62   | 59    | 60   | 11   |
| 95°  | 93   | 111   | 114  | 114   | 111  | 103  |
| 105° | 383  | 388   | 392  | 395   | 395  | 405  |
| 115° | 713  | 723   | 720  | 718   | 713  | 705  |
| 125° | 1037 | 1053  | 1048 | 1042  | 1040 | 927  |
| 135° | 1342 | 1361  | 1365 | 1363  | 1358 | 1037 |
| 145° | 1629 | 1642  | 1652 | 1654  | 1647 | 1018 |
| 155° | 1862 | 1868  | 1873 | 1882  | 1876 | 857  |
| 165° | 2026 | 2024  | 2024 | 2037  | 2028 | 572  |
| 175° | 2108 | 2103  | 2099 | 2112  | 2101 | 200  |
| 180° | 2112 | 2112  | 2112 | 2112  | 2112 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2227.2 | 2227.2 | 2227.2 | 2227.2 | 2227.2 |
| 2.5°   | 2240.2 | 2229.5 | 2205.8 | 2227.2 | 2223.1 |
| 5°     | 2227.2 | 2218.8 | 2195.2 | 2212.2 | 2208.1 |
| 7.5°   | 2212.2 | 2199.5 | 2175.9 | 2193.2 | 2188.9 |
| 10°    | 2188.9 | 2173.9 | 2148.1 | 2165.2 | 2158.8 |
| 12.5°  | 2156.6 | 2143.8 | 2118.2 | 2128.9 | 2124.6 |
| 15°    | 2120.2 | 2107.5 | 2079.5 | 2088.2 | 2077.5 |
| 17.5°  | 2075.2 | 2062.5 | 2034.6 | 2045.2 | 2034.6 |
| 20°    | 2025.9 | 2013.2 | 1983.2 | 1989.6 | 1981.2 |
| 22.5°  | 1976.9 | 1957.5 | 1929.6 | 1929.6 | 1925.3 |
| 25°    | 1918.9 | 1901.9 | 1865.5 | 1869.6 | 1865.5 |
| 27.5°  | 1854.6 | 1839.6 | 1811.8 | 1805.5 | 1794.9 |
| 30°    | 1790.6 | 1773.2 | 1741.2 | 1734.8 | 1726.2 |
| 32.5°  | 1721.9 | 1709.2 | 1674.8 | 1661.9 | 1653.3 |
| 35°    | 1655.6 | 1634.2 | 1599.9 | 1586.9 | 1576.2 |
| 37.5°  | 1580.6 | 1561.2 | 1527.0 | 1511.9 | 1501.2 |
| 40°    | 1503.5 | 1486.2 | 1452.0 | 1432.9 | 1424.2 |
| 42.5°  | 1428.5 | 1411.3 | 1377.2 | 1355.6 | 1342.9 |
| 45°    | 1347.2 | 1332.2 | 1299.9 | 1276.5 | 1267.9 |
| 47.5°  | 1267.9 | 1252.9 | 1218.6 | 1195.0 | 1182.2 |
| 50°    | 1184.3 | 1173.6 | 1143.7 | 1113.6 | 1102.9 |
| 52.5°  | 1102.9 | 1087.9 | 1060.2 | 1036.6 | 1021.6 |
| 55°    | 1019.5 | 1006.6 | 980.9  | 955.2  | 944.6  |
| 57.5°  | 936.0  | 925.3  | 897.3  | 871.7  | 863.0  |
| 60°    | 852.3  | 843.9  | 814.0  | 790.3  | 783.9  |
| 62.5°  | 770.9  | 755.9  | 734.6  | 713.2  | 704.6  |
| 65°    | 687.5  | 674.7  | 653.3  | 633.9  | 623.2  |
| 67.5°  | 601.9  | 591.0  | 571.9  | 556.9  | 548.3  |
| 70°    | 522.6  | 514.0  | 494.6  | 479.7  | 471.3  |
| 72.5°  | 441.2  | 432.6  | 422.0  | 407.0  | 400.6  |
| 75°    | 359.7  | 355.7  | 344.7  | 332.0  | 336.3  |
| 77.5°  | 287.0  | 278.4  | 274.0  | 267.7  | 261.3  |
| 80°    | 214.3  | 212.0  | 207.7  | 201.3  | 197.0  |
| 82.5°  | 145.7  | 145.7  | 143.6  | 135.0  | 135.0  |
| 85°    | 87.7   | 85.7   | 83.6   | 77.0   | 75.0   |
| 87.5°  | 38.6   | 34.3   | 30.0   | 23.7   | 21.4   |
| 90°    | 1.9    | 22.9   | 62.4   | 58.6   | 60.5   |
| 92.5°  | 39.5   | 53.5   | 55.4   | 57.3   | 57.3   |
| 95°    | 92.9   | 110.8  | 114.0  | 114.0  | 110.8  |
| 97.5°  | 154.7  | 171.2  | 178.3  | 178.3  | 178.3  |
| 100°   | 226.0  | 240.7  | 245.8  | 245.8  | 243.8  |
| 102.5° | 301.2  | 312.0  | 319.0  | 320.9  | 319.0  |
| 105°   | 383.3  | 388.4  | 392.2  | 395.4  | 395.4  |
| 107.5° | 464.8  | 472.4  | 472.4  | 473.8  | 464.8  |
| 110°   | 543.8  | 554.0  | 554.0  | 554.0  | 548.8  |



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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 629.1  | 639.9  | 638.0  | 632.9  | 629.1  |
| 115°   | 713.1  | 723.3  | 720.2  | 718.3  | 713.1  |
| 117.5° | 796.5  | 810.5  | 801.6  | 796.5  | 791.4  |
| 120°   | 880.5  | 894.6  | 880.5  | 880.5  | 874.8  |
| 122.5° | 957.0  | 974.8  | 965.9  | 960.8  | 957.0  |
| 125°   | 1037.2 | 1053.1 | 1048.1 | 1042.3 | 1040.4 |
| 127.5° | 1115.5 | 1135.3 | 1128.3 | 1120.7 | 1115.5 |
| 130°   | 1188.8 | 1211.7 | 1208.5 | 1204.7 | 1197.7 |
| 132.5° | 1270.9 | 1288.8 | 1290.0 | 1281.1 | 1276.0 |
| 135°   | 1341.6 | 1361.3 | 1365.2 | 1363.2 | 1358.1 |
| 137.5° | 1420.5 | 1436.4 | 1439.6 | 1438.3 | 1430.7 |
| 140°   | 1490.0 | 1505.9 | 1514.8 | 1514.8 | 1507.8 |
| 142.5° | 1561.2 | 1577.2 | 1582.2 | 1584.1 | 1577.2 |
| 145°   | 1628.8 | 1641.5 | 1651.7 | 1653.6 | 1646.6 |
| 147.5° | 1689.2 | 1705.2 | 1712.8 | 1716.0 | 1709.0 |
| 150°   | 1751.6 | 1762.4 | 1769.5 | 1775.2 | 1769.5 |
| 152.5° | 1807.0 | 1817.8 | 1826.7 | 1833.8 | 1826.7 |
| 155°   | 1862.4 | 1867.5 | 1873.3 | 1882.1 | 1876.4 |
| 157.5° | 1910.2 | 1914.0 | 1917.2 | 1929.9 | 1921.0 |
| 160°   | 1952.8 | 1956.7 | 1958.6 | 1969.3 | 1961.7 |
| 162.5° | 1992.3 | 1992.3 | 1994.2 | 2006.3 | 1997.4 |
| 165°   | 2026.0 | 2024.1 | 2024.1 | 2036.9 | 2027.9 |
| 167.5° | 2056.6 | 2050.9 | 2050.9 | 2063.6 | 2054.7 |
| 170°   | 2079.5 | 2074.5 | 2072.6 | 2085.3 | 2074.5 |
| 172.5° | 2095.5 | 2090.3 | 2088.4 | 2101.2 | 2090.3 |
| 175°   | 2108.1 | 2103.1 | 2099.3 | 2112.0 | 2101.2 |
| 177.5° | 2115.2 | 2110.1 | 2106.2 | 2117.1 | 2106.2 |
| 180°   | 2112.0 | 2112.0 | 2112.0 | 2112.0 | 2112.0 |

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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 | 8.48             | 9.33  | 9.44  | 10.31 | 11.59 | 8.03           | 8.88  | 9.00  | 9.86  | 11.15 |
|                 | 3H   | 10.14            | 10.90 | 11.12 | 11.89 | 13.20 | 9.65           | 10.41 | 10.63 | 11.40 | 12.71 |
|                 | 4H   | 10.73            | 11.46 | 11.72 | 12.45 | 13.76 | 10.24          | 10.96 | 11.23 | 11.95 | 13.27 |
|                 | 6H   | 11.14            | 11.80 | 12.14 | 12.80 | 14.13 | 10.63          | 11.30 | 11.64 | 12.30 | 13.63 |
|                 | 8H   | 11.24            | 11.88 | 12.25 | 12.89 | 14.22 | 10.74          | 11.38 | 11.75 | 12.39 | 13.71 |
|                 | 12H  | 11.29            | 11.90 | 12.30 | 12.91 | 14.25 | 10.78          | 11.39 | 11.79 | 12.40 | 13.74 |
| 4H              | 2H   | 8.94             | 9.66  | 9.93  | 10.65 | 11.97 | 8.58           | 9.31  | 9.58  | 10.30 | 11.61 |
|                 | 3H   | 10.81            | 11.41 | 11.81 | 12.43 | 13.76 | 10.40          | 11.00 | 11.41 | 12.03 | 13.36 |
|                 | 4H   | 11.53            | 12.08 | 12.54 | 13.09 | 14.45 | 11.10          | 11.65 | 12.12 | 12.67 | 14.02 |
|                 | 6H   | 12.05            | 12.52 | 13.07 | 13.56 | 14.91 | 11.61          | 12.09 | 12.64 | 13.13 | 14.48 |
|                 | 8H   | 12.20            | 12.64 | 13.22 | 13.67 | 15.04 | 11.76          | 12.21 | 12.79 | 13.24 | 14.60 |
|                 | 12H  | 12.27            | 12.68 | 13.32 | 13.72 | 15.09 | 11.82          | 12.23 | 12.87 | 13.27 | 14.64 |
| 8H              | 4H   | 11.72            | 12.17 | 12.75 | 13.20 | 14.56 | 11.35          | 11.79 | 12.37 | 12.82 | 14.19 |
|                 | 6H   | 12.36            | 12.73 | 13.41 | 13.80 | 15.16 | 11.98          | 12.34 | 13.03 | 13.42 | 14.78 |
|                 | 8H   | 12.58            | 12.91 | 13.64 | 13.97 | 15.35 | 12.19          | 12.52 | 13.25 | 13.57 | 14.95 |
|                 | 12H  | 12.72            | 13.00 | 13.78 | 14.06 | 15.48 | 12.31          | 12.59 | 13.37 | 13.65 | 15.07 |
| 12H             | 4H   | 11.71            | 12.11 | 12.75 | 13.16 | 14.53 | 11.34          | 11.74 | 12.38 | 12.79 | 14.16 |
|                 | 6H   | 12.39            | 12.71 | 13.45 | 13.77 | 15.15 | 12.02          | 12.34 | 13.08 | 13.40 | 14.78 |
|                 | 8H   | 12.64            | 12.92 | 13.70 | 13.97 | 15.40 | 12.26          | 12.54 | 13.32 | 13.59 | 15.02 |