

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: P913326

Luminaire Tested: DFN2DIP-4P4F0-080D080US927-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P913326  
REPORT IS A COMBINATION OF REPORTS P899149 AND P895967  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-4P4F0-080D080US927-FLLFLL  
Description: 4 foot, 90deg - 4way Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

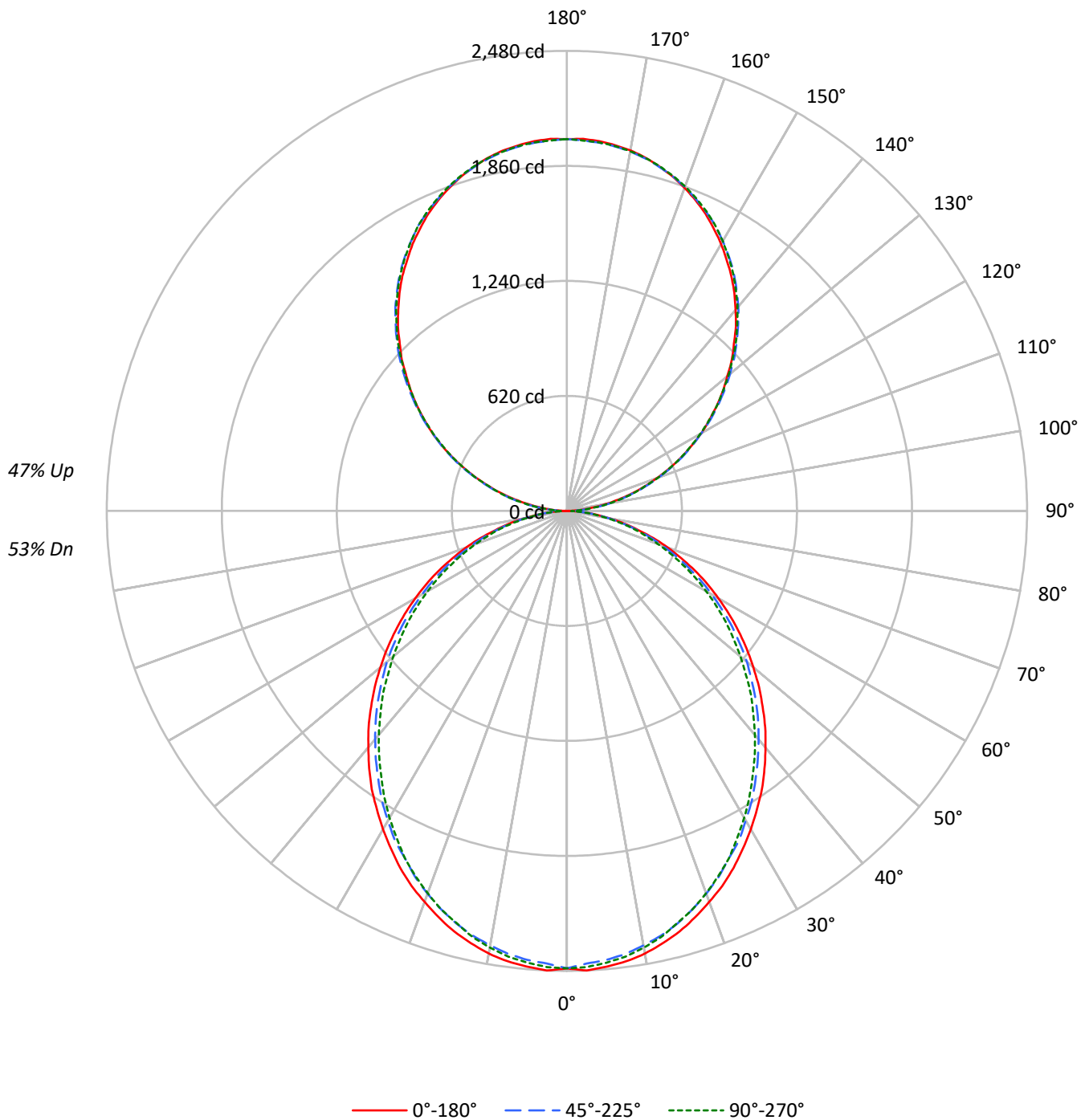
Lumens per Lamp: N/A  
Luminaire Lumens: 11882.7 lumens  
Efficiency: N/A  
Efficacy: 74.6 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 4.07' x L: 4.07' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 159.3  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9971  
Total Harmonic Distortion (THDi): 0.049  
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   | 98  | 94  | 90  | 87  | 91  | 87  | 84  | 81  | 74 | 72 | 70 | 63 | 61 | 59 | 52 | 51 | 50 |
| 2   | 90  | 82  | 76  | 71  | 83  | 76  | 71  | 66  | 65 | 61 | 58 | 55 | 52 | 50 | 46 | 44 | 42 |
| 3   | 82  | 72  | 65  | 59  | 75  | 67  | 61  | 55  | 58 | 53 | 49 | 49 | 45 | 42 | 41 | 38 | 36 |
| 4   | 75  | 64  | 56  | 50  | 69  | 60  | 52  | 47  | 51 | 46 | 41 | 43 | 39 | 36 | 36 | 33 | 31 |
| 5   | 69  | 57  | 49  | 43  | 63  | 53  | 46  | 40  | 46 | 40 | 36 | 39 | 35 | 31 | 33 | 29 | 27 |
| 6   | 63  | 51  | 43  | 37  | 58  | 48  | 40  | 35  | 41 | 36 | 31 | 35 | 31 | 27 | 30 | 26 | 24 |
| 7   | 59  | 46  | 38  | 33  | 54  | 43  | 36  | 31  | 37 | 32 | 28 | 32 | 28 | 24 | 27 | 24 | 21 |
| 8   | 54  | 42  | 34  | 29  | 50  | 39  | 32  | 27  | 34 | 29 | 24 | 29 | 25 | 22 | 25 | 21 | 19 |
| 9   | 51  | 38  | 31  | 26  | 47  | 36  | 29  | 24  | 31 | 26 | 22 | 27 | 23 | 19 | 23 | 20 | 17 |
| 10  | 47  | 35  | 28  | 23  | 44  | 33  | 26  | 22  | 29 | 23 | 20 | 25 | 21 | 18 | 21 | 18 | 15 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1600 | 1600 | 1600 |
| 5°  | 1602 | 1578 | 1589 |
| 10° | 1590 | 1557 | 1568 |
| 15° | 1566 | 1532 | 1535 |
| 20° | 1535 | 1497 | 1501 |
| 25° | 1504 | 1455 | 1462 |
| 30° | 1464 | 1416 | 1412 |
| 35° | 1427 | 1370 | 1359 |
| 40° | 1381 | 1323 | 1308 |
| 45° | 1336 | 1276 | 1257 |
| 50° | 1286 | 1227 | 1197 |
| 55° | 1233 | 1170 | 1143 |
| 60° | 1174 | 1103 | 1080 |
| 65° | 1110 | 1033 | 1006 |
| 70° | 1028 | 948  | 927  |
| 75° | 914  | 847  | 855  |
| 80° | 778  | 718  | 715  |
| 85° | 564  | 493  | 482  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 1517 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 232.1   | 2.0       |
| 10°-20°   | 653.0   | 5.5       |
| 20°-30°   | 959.7   | 8.1       |
| 30°-40°   | 1114.6  | 9.4       |
| 40°-50°   | 1113.2  | 9.4       |
| 50°-60°   | 970.7   | 8.2       |
| 60°-70°   | 717.6   | 6.0       |
| 70°-80°   | 406.0   | 3.4       |
| 80°-90°   | 112.9   | 0.9       |
| 90°-100°  | 124.0   | 1.0       |
| 100°-110° | 394.1   | 3.3       |
| 110°-120° | 674.4   | 5.7       |
| 120°-130° | 886.9   | 7.5       |
| 130°-140° | 995.5   | 8.4       |
| 140°-150° | 976.2   | 8.2       |
| 150°-160° | 818.9   | 6.9       |
| 160°-170° | 543.1   | 4.6       |
| 170°-180° | 189.8   | 1.6       |
| 0°-30°    | 1844.8  | 15.5      |
| 0°-40°    | 2959.4  | 24.9      |
| 0°-60°    | 5043.4  | 42.4      |
| 0°-90°    | 6279.8  | 52.8      |
| 90°-120°  | 1192.5  | 10.0      |
| 90°-150°  | 4051.1  | 34.1      |
| 90°-180°  | 5603.0  | 47.2      |
| 0°-180°   | 11882.7 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2466 | 2466  | 2466 | 2466  | 2466 |      |
| 5°   | 2466 | 2457  | 2430 | 2449  | 2445 | 234  |
| 15°  | 2348 | 2333  | 2302 | 2312  | 2300 | 661  |
| 25°  | 2125 | 2106  | 2066 | 2070  | 2066 | 978  |
| 35°  | 1833 | 1809  | 1771 | 1757  | 1745 | 1145 |
| 45°  | 1492 | 1475  | 1439 | 1413  | 1404 | 1151 |
| 55°  | 1129 | 1114  | 1086 | 1058  | 1046 | 1009 |
| 65°  | 761  | 747   | 723  | 702   | 690  | 753  |
| 75°  | 398  | 394   | 382  | 368   | 372  | 425  |
| 85°  | 97   | 95    | 93   | 85    | 83   | 108  |
| 90°  | 2    | 22    | 59   | 56    | 57   | 11   |
| 95°  | 88   | 105   | 108  | 108   | 105  | 98   |
| 105° | 364  | 369   | 372  | 375   | 375  | 384  |
| 115° | 677  | 686   | 683  | 682   | 677  | 669  |
| 125° | 984  | 999   | 995  | 989   | 987  | 880  |
| 135° | 1273 | 1292  | 1296 | 1294  | 1289 | 984  |
| 145° | 1546 | 1558  | 1567 | 1569  | 1563 | 966  |
| 155° | 1767 | 1772  | 1778 | 1786  | 1781 | 813  |
| 165° | 1923 | 1921  | 1921 | 1933  | 1924 | 542  |
| 175° | 2001 | 1996  | 1992 | 2004  | 1994 | 190  |
| 180° | 2004 | 2004  | 2004 | 2004  | 2004 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2465.9 | 2465.9 | 2465.9 | 2465.9 | 2465.9 |
| 2.5°   | 2480.2 | 2468.4 | 2442.3 | 2465.9 | 2461.4 |
| 5°     | 2465.9 | 2456.6 | 2430.5 | 2449.3 | 2444.8 |
| 7.5°   | 2449.3 | 2435.2 | 2409.1 | 2428.2 | 2423.4 |
| 10°    | 2423.4 | 2406.8 | 2378.4 | 2397.2 | 2390.2 |
| 12.5°  | 2387.7 | 2373.6 | 2345.2 | 2357.0 | 2352.2 |
| 15°    | 2347.5 | 2333.4 | 2302.4 | 2312.0 | 2300.2 |
| 17.5°  | 2297.6 | 2283.5 | 2252.6 | 2264.4 | 2252.6 |
| 20°    | 2243.1 | 2229.0 | 2195.8 | 2202.8 | 2193.5 |
| 22.5°  | 2188.7 | 2167.3 | 2136.4 | 2136.4 | 2131.6 |
| 25°    | 2124.6 | 2105.7 | 2065.5 | 2070.0 | 2065.5 |
| 27.5°  | 2053.3 | 2036.8 | 2006.0 | 1999.0 | 1987.2 |
| 30°    | 1982.4 | 1963.3 | 1927.9 | 1920.8 | 1911.2 |
| 32.5°  | 1906.5 | 1892.4 | 1854.3 | 1840.0 | 1830.5 |
| 35°    | 1832.9 | 1809.3 | 1771.3 | 1757.0 | 1745.2 |
| 37.5°  | 1749.9 | 1728.5 | 1690.6 | 1674.0 | 1662.2 |
| 40°    | 1664.7 | 1645.5 | 1607.6 | 1586.4 | 1576.8 |
| 42.5°  | 1581.7 | 1562.5 | 1524.8 | 1500.9 | 1486.8 |
| 45°    | 1491.6 | 1475.0 | 1439.2 | 1413.3 | 1403.8 |
| 47.5°  | 1403.8 | 1387.2 | 1349.2 | 1323.0 | 1308.9 |
| 50°    | 1311.2 | 1299.4 | 1266.1 | 1233.0 | 1221.1 |
| 52.5°  | 1221.1 | 1204.5 | 1173.9 | 1147.7 | 1131.1 |
| 55°    | 1128.8 | 1114.4 | 1086.1 | 1057.6 | 1045.8 |
| 57.5°  | 1036.3 | 1024.4 | 993.5  | 965.0  | 955.4  |
| 60°    | 943.6  | 934.4  | 901.1  | 875.0  | 867.9  |
| 62.5°  | 853.6  | 837.0  | 813.3  | 789.7  | 780.1  |
| 65°    | 761.3  | 746.9  | 723.3  | 701.9  | 690.1  |
| 67.5°  | 666.4  | 654.3  | 633.2  | 616.6  | 607.0  |
| 70°    | 578.6  | 569.0  | 547.7  | 531.1  | 521.7  |
| 72.5°  | 488.5  | 479.0  | 467.1  | 450.6  | 443.5  |
| 75°    | 398.2  | 393.7  | 381.7  | 367.6  | 372.3  |
| 77.5°  | 317.7  | 308.2  | 303.4  | 296.4  | 289.3  |
| 80°    | 237.3  | 234.7  | 230.0  | 222.9  | 218.1  |
| 82.5°  | 161.3  | 161.3  | 159.0  | 149.4  | 149.4  |
| 85°    | 97.1   | 94.8   | 92.6   | 85.3   | 83.0   |
| 87.5°  | 42.8   | 38.0   | 33.2   | 26.1   | 23.7   |
| 90°    | 1.8    | 21.8   | 59.3   | 55.6   | 57.4   |
| 92.5°  | 37.5   | 50.8   | 52.6   | 54.3   | 54.3   |
| 95°    | 88.2   | 105.1  | 108.1  | 108.1  | 105.1  |
| 97.5°  | 146.9  | 162.6  | 169.2  | 169.2  | 169.2  |
| 100°   | 214.5  | 228.4  | 233.2  | 233.2  | 231.4  |
| 102.5° | 285.8  | 296.1  | 302.7  | 304.5  | 302.7  |
| 105°   | 363.8  | 368.6  | 372.2  | 375.3  | 375.3  |
| 107.5° | 441.1  | 448.4  | 448.4  | 449.6  | 441.1  |
| 110°   | 516.0  | 525.7  | 525.7  | 525.7  | 520.9  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 597.0  | 607.3  | 605.5  | 600.6  | 597.0  |
| 115°   | 676.8  | 686.4  | 683.4  | 681.6  | 676.8  |
| 117.5° | 755.9  | 769.2  | 760.7  | 755.9  | 751.1  |
| 120°   | 835.7  | 849.0  | 835.7  | 835.7  | 830.2  |
| 122.5° | 908.2  | 925.1  | 916.6  | 911.8  | 908.2  |
| 125°   | 984.3  | 999.4  | 994.6  | 989.1  | 987.4  |
| 127.5° | 1058.7 | 1077.4 | 1070.7 | 1063.5 | 1058.7 |
| 130°   | 1128.1 | 1149.9 | 1146.8 | 1143.3 | 1136.6 |
| 132.5° | 1206.1 | 1223.0 | 1224.2 | 1215.8 | 1210.9 |
| 135°   | 1273.1 | 1291.9 | 1295.5 | 1293.7 | 1288.9 |
| 137.5° | 1348.1 | 1363.2 | 1366.2 | 1365.0 | 1357.7 |
| 140°   | 1414.0 | 1429.0 | 1437.5 | 1437.5 | 1430.8 |
| 142.5° | 1481.6 | 1496.7 | 1501.6 | 1503.4 | 1496.7 |
| 145°   | 1545.7 | 1557.7 | 1567.4 | 1569.2 | 1562.6 |
| 147.5° | 1603.1 | 1618.2 | 1625.4 | 1628.5 | 1621.8 |
| 150°   | 1662.3 | 1672.5 | 1679.2 | 1684.7 | 1679.2 |
| 152.5° | 1714.8 | 1725.1 | 1733.6 | 1740.3 | 1733.6 |
| 155°   | 1767.4 | 1772.3 | 1777.7 | 1786.1 | 1780.7 |
| 157.5° | 1812.7 | 1816.4 | 1819.4 | 1831.4 | 1823.0 |
| 160°   | 1853.2 | 1856.9 | 1858.7 | 1868.9 | 1861.7 |
| 162.5° | 1890.7 | 1890.7 | 1892.5 | 1904.0 | 1895.5 |
| 165°   | 1922.7 | 1920.9 | 1920.9 | 1933.0 | 1924.5 |
| 167.5° | 1951.7 | 1946.3 | 1946.3 | 1958.4 | 1949.9 |
| 170°   | 1973.5 | 1968.6 | 1966.8 | 1978.9 | 1968.6 |
| 172.5° | 1988.6 | 1983.8 | 1982.0 | 1994.0 | 1983.8 |
| 175°   | 2000.7 | 1995.8 | 1992.2 | 2004.3 | 1994.0 |
| 177.5° | 2007.3 | 2002.5 | 1998.8 | 2009.1 | 1998.8 |
| 180°   | 2004.3 | 2004.3 | 2004.3 | 2004.3 | 2004.3 |

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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 | 9.18             | 10.07 | 10.11 | 11.02 | 12.25 | 8.74           | 9.62  | 9.67  | 10.57 | 11.80 |
|                 | 3H   | 10.85            | 11.65 | 11.79 | 12.60 | 13.86 | 10.36          | 11.16 | 11.30 | 12.11 | 13.37 |
|                 | 4H   | 11.44            | 12.20 | 12.40 | 13.16 | 14.42 | 10.95          | 11.70 | 11.91 | 12.66 | 13.93 |
|                 | 6H   | 11.85            | 12.54 | 12.82 | 13.51 | 14.79 | 11.35          | 12.04 | 12.32 | 13.01 | 14.29 |
|                 | 8H   | 11.96            | 12.62 | 12.93 | 13.60 | 14.88 | 11.45          | 12.11 | 12.43 | 13.10 | 14.37 |
|                 | 12H  | 12.01            | 12.64 | 12.99 | 13.62 | 14.91 | 11.50          | 12.13 | 12.48 | 13.11 | 14.40 |
| 4H              | 2H   | 9.65             | 10.40 | 10.61 | 11.36 | 12.63 | 9.29           | 10.05 | 10.26 | 11.01 | 12.27 |
|                 | 3H   | 11.52            | 12.15 | 12.49 | 13.14 | 14.42 | 11.11          | 11.74 | 12.09 | 12.74 | 14.01 |
|                 | 4H   | 12.24            | 12.82 | 13.22 | 13.80 | 15.10 | 11.82          | 12.39 | 12.80 | 13.38 | 14.68 |
|                 | 6H   | 12.76            | 13.26 | 13.76 | 14.27 | 15.57 | 12.33          | 12.83 | 13.33 | 13.84 | 15.13 |
|                 | 8H   | 12.92            | 13.38 | 13.91 | 14.38 | 15.70 | 12.48          | 12.94 | 13.48 | 13.95 | 15.26 |
|                 | 12H  | 12.99            | 13.41 | 14.01 | 14.43 | 15.75 | 12.54          | 12.96 | 13.56 | 13.98 | 15.30 |
| 8H              | 4H   | 12.44            | 12.90 | 13.44 | 13.91 | 15.22 | 12.06          | 12.53 | 13.06 | 13.53 | 14.84 |
|                 | 6H   | 13.08            | 13.46 | 14.10 | 14.51 | 15.82 | 12.70          | 13.08 | 13.72 | 14.12 | 15.44 |
|                 | 8H   | 13.30            | 13.64 | 14.33 | 14.67 | 16.00 | 12.91          | 13.25 | 13.94 | 14.28 | 15.61 |
|                 | 12H  | 13.44            | 13.74 | 14.47 | 14.76 | 16.14 | 13.03          | 13.33 | 14.06 | 14.35 | 15.73 |
| 12H             | 4H   | 12.43            | 12.85 | 13.44 | 13.87 | 15.18 | 12.06          | 12.48 | 13.08 | 13.50 | 14.82 |
|                 | 6H   | 13.11            | 13.45 | 14.14 | 14.48 | 15.81 | 12.74          | 13.08 | 13.77 | 14.11 | 15.44 |
|                 | 8H   | 13.36            | 13.66 | 14.39 | 14.68 | 16.06 | 12.98          | 13.28 | 14.01 | 14.30 | 15.68 |