

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: P922148

Luminaire Tested: DFN2DIP-PN3F0-060D080US940-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P922148  
REPORT IS A COMBINATION OF REPORTS P899587 AND P896399  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN3F0-060D080US940-FLLFLL  
Description: 3 foot, Pentagon Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

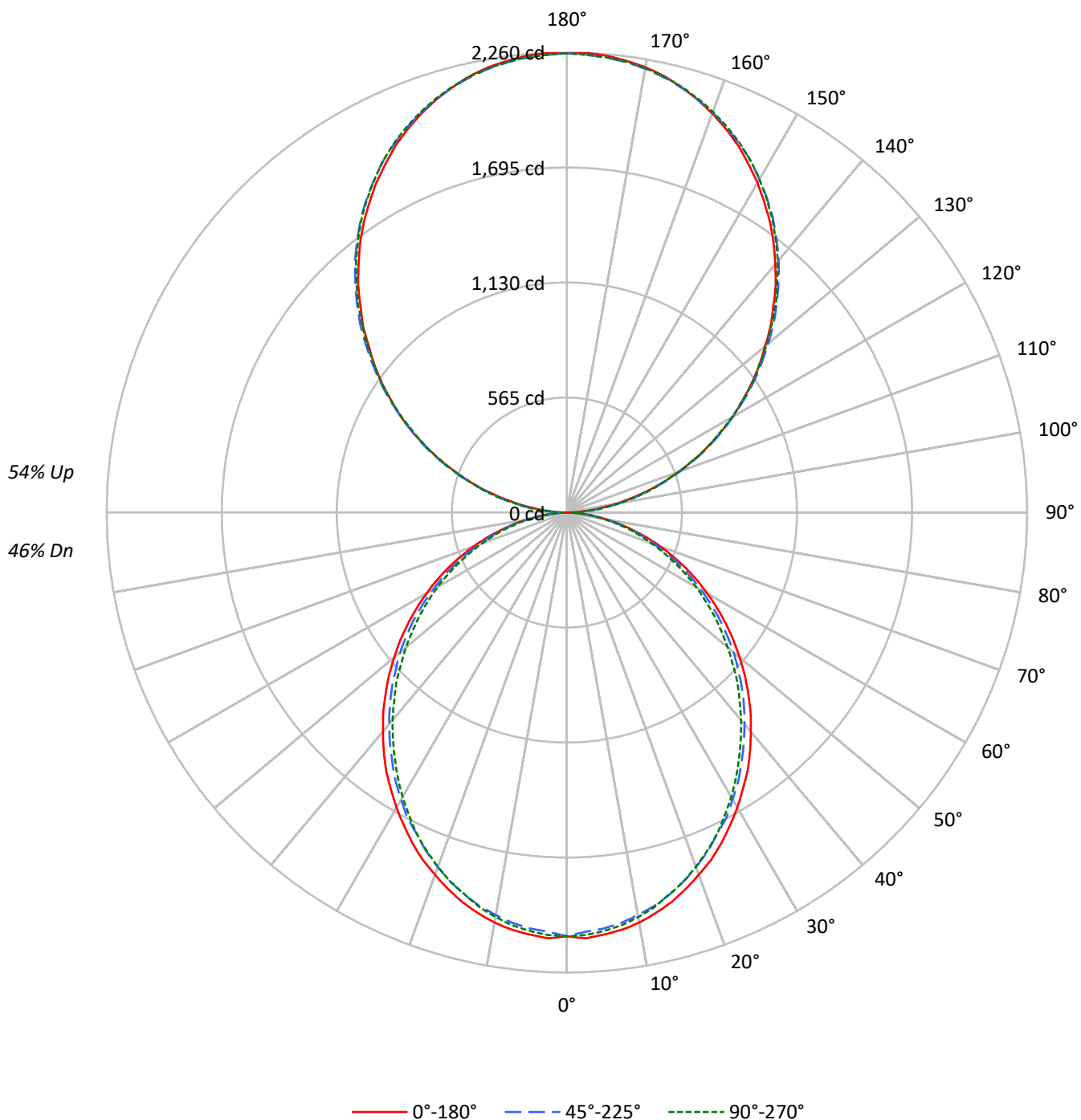
Lumens per Lamp: N/A  
Luminaire Lumens: 11610.1 lumens  
Efficiency: N/A  
Efficacy: 98.1 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 2.96' x L: 3.11' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 118.4  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9821  
Total Harmonic Distortion (THDi): 0.08  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

TEST NUMBER: P922148

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### Luminous Intensity Polar Plot



TEST NUMBER: P922148

CATALOG NUMBER: DFN2DIP-PN3F0-060D080US940-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   | 106 | 106 | 106 | 106 | 97 | 97 | 97 | 97 | 81 | 81 | 81 | 66 | 66 | 66 | 52 | 52 | 52 |
| 1   | 97  | 93  | 89  | 85  | 89 | 85 | 82 | 79 | 71 | 69 | 66 | 58 | 56 | 55 | 46 | 45 | 44 |
| 2   | 88  | 81  | 75  | 70  | 81 | 74 | 69 | 65 | 62 | 58 | 55 | 51 | 48 | 46 | 41 | 39 | 37 |
| 3   | 80  | 71  | 64  | 58  | 73 | 65 | 59 | 54 | 55 | 50 | 46 | 45 | 42 | 39 | 36 | 34 | 32 |
| 4   | 74  | 63  | 55  | 49  | 67 | 58 | 51 | 46 | 49 | 43 | 39 | 40 | 36 | 33 | 32 | 29 | 27 |
| 5   | 67  | 56  | 48  | 42  | 62 | 52 | 45 | 39 | 44 | 38 | 34 | 36 | 32 | 29 | 29 | 26 | 24 |
| 6   | 62  | 50  | 42  | 36  | 57 | 46 | 39 | 34 | 39 | 34 | 30 | 33 | 28 | 25 | 26 | 23 | 21 |
| 7   | 57  | 45  | 37  | 32  | 53 | 42 | 35 | 30 | 36 | 30 | 26 | 30 | 25 | 22 | 24 | 21 | 19 |
| 8   | 53  | 41  | 33  | 28  | 49 | 38 | 31 | 26 | 32 | 27 | 23 | 27 | 23 | 20 | 22 | 19 | 17 |
| 9   | 50  | 37  | 30  | 25  | 45 | 35 | 28 | 24 | 30 | 24 | 21 | 25 | 21 | 18 | 20 | 17 | 15 |
| 10  | 46  | 34  | 27  | 22  | 42 | 32 | 25 | 21 | 27 | 22 | 19 | 23 | 19 | 16 | 19 | 16 | 14 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2434 | 2434 | 2434 |
| 5°  | 2436 | 2398 | 2415 |
| 10° | 2415 | 2364 | 2381 |
| 15° | 2378 | 2323 | 2329 |
| 20° | 2328 | 2268 | 2276 |
| 25° | 2279 | 2201 | 2214 |
| 30° | 2218 | 2139 | 2136 |
| 35° | 2160 | 2067 | 2054 |
| 40° | 2088 | 1993 | 1975 |
| 45° | 2017 | 1919 | 1895 |
| 50° | 1939 | 1842 | 1802 |
| 55° | 1857 | 1752 | 1717 |
| 60° | 1764 | 1646 | 1618 |
| 65° | 1663 | 1535 | 1503 |
| 70° | 1534 | 1401 | 1378 |
| 75° | 1356 | 1240 | 1261 |
| 80° | 1141 | 1033 | 1040 |
| 85° | 803  | 683  | 678  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 2235 cd/sqm

TEST NUMBER: P922148

CATALOG NUMBER: DFN2DIP-PN3F0-060D080US940-FLLFLL

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 195.9   | 1.7       |
| 10°-20°   | 551.3   | 4.7       |
| 20°-30°   | 810.2   | 7.0       |
| 30°-40°   | 941.0   | 8.1       |
| 40°-50°   | 939.8   | 8.1       |
| 50°-60°   | 819.5   | 7.1       |
| 60°-70°   | 605.8   | 5.2       |
| 70°-80°   | 342.7   | 3.0       |
| 80°-90°   | 96.9    | 0.8       |
| 90°-100°  | 139.6   | 1.2       |
| 100°-110° | 443.6   | 3.8       |
| 110°-120° | 759.1   | 6.5       |
| 120°-130° | 998.3   | 8.6       |
| 130°-140° | 1120.6  | 9.7       |
| 140°-150° | 1098.9  | 9.5       |
| 150°-160° | 921.8   | 7.9       |
| 160°-170° | 611.3   | 5.3       |
| 170°-180° | 213.7   | 1.8       |
| 0°-30°    | 1557.4  | 13.4      |
| 0°-40°    | 2498.4  | 21.5      |
| 0°-60°    | 4257.8  | 36.7      |
| 0°-90°    | 5303.2  | 45.7      |
| 90°-120°  | 1342.3  | 11.6      |
| 90°-150°  | 4560.1  | 39.3      |
| 90°-180°  | 6307.0  | 54.3      |
| 0°-180°   | 11610.1 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2082 | 2082  | 2082 | 2082  | 2082 |      |
| 5°   | 2082 | 2074  | 2052 | 2068  | 2064 | 198  |
| 15°  | 1982 | 1970  | 1944 | 1952  | 1942 | 558  |
| 25°  | 1794 | 1778  | 1744 | 1748  | 1744 | 825  |
| 35°  | 1548 | 1528  | 1495 | 1483  | 1473 | 966  |
| 45°  | 1259 | 1245  | 1215 | 1193  | 1185 | 972  |
| 55°  | 953  | 941   | 917  | 893   | 883  | 852  |
| 65°  | 643  | 631   | 611  | 592   | 583  | 635  |
| 75°  | 336  | 332   | 322  | 310   | 314  | 359  |
| 85°  | 82   | 80    | 78   | 72    | 70   | 91   |
| 90°  | 2    | 24    | 67   | 63    | 65   | 11   |
| 95°  | 99   | 118   | 122  | 122   | 118  | 111  |
| 105° | 410  | 415   | 419  | 422   | 422  | 432  |
| 115° | 762  | 773   | 769  | 767   | 762  | 753  |
| 125° | 1108 | 1125  | 1120 | 1113  | 1111 | 990  |
| 135° | 1433 | 1454  | 1458 | 1456  | 1451 | 1108 |
| 145° | 1740 | 1754  | 1764 | 1766  | 1759 | 1087 |
| 155° | 1990 | 1995  | 2001 | 2010  | 2004 | 916  |
| 165° | 2164 | 2162  | 2162 | 2176  | 2166 | 611  |
| 175° | 2252 | 2247  | 2242 | 2256  | 2244 | 214  |
| 180° | 2256 | 2256  | 2256 | 2256  | 2256 |      |

TEST NUMBER: P922148

CATALOG NUMBER: DFN2DIP-PN3F0-060D080US940-FLLFLL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2081.8 | 2081.8 | 2081.8 | 2081.8 | 2081.8 |
| 2.5°   | 2093.9 | 2083.9 | 2061.8 | 2081.8 | 2078.0 |
| 5°     | 2081.8 | 2073.9 | 2051.8 | 2067.8 | 2064.0 |
| 7.5°   | 2067.8 | 2055.9 | 2033.8 | 2050.0 | 2045.9 |
| 10°    | 2045.9 | 2031.9 | 2007.9 | 2023.8 | 2017.9 |
| 12.5°  | 2015.8 | 2003.9 | 1979.9 | 1989.9 | 1985.8 |
| 15°    | 1981.7 | 1969.9 | 1943.8 | 1951.9 | 1941.9 |
| 17.5°  | 1939.7 | 1927.9 | 1901.8 | 1911.6 | 1901.8 |
| 20°    | 1893.6 | 1881.8 | 1853.7 | 1859.7 | 1851.8 |
| 22.5°  | 1847.8 | 1829.7 | 1803.6 | 1803.6 | 1799.6 |
| 25°    | 1793.6 | 1777.7 | 1743.7 | 1747.5 | 1743.7 |
| 27.5°  | 1733.5 | 1719.5 | 1693.5 | 1687.7 | 1677.7 |
| 30°    | 1673.7 | 1657.4 | 1627.5 | 1621.6 | 1613.5 |
| 32.5°  | 1609.4 | 1597.6 | 1565.5 | 1553.4 | 1545.3 |
| 35°    | 1547.5 | 1527.5 | 1495.4 | 1483.3 | 1473.3 |
| 37.5°  | 1477.4 | 1459.3 | 1427.3 | 1413.2 | 1403.2 |
| 40°    | 1405.3 | 1389.2 | 1357.2 | 1339.3 | 1331.2 |
| 42.5°  | 1335.2 | 1319.1 | 1287.3 | 1267.1 | 1255.2 |
| 45°    | 1259.3 | 1245.2 | 1215.0 | 1193.2 | 1185.1 |
| 47.5°  | 1185.1 | 1171.1 | 1139.1 | 1117.0 | 1105.0 |
| 50°    | 1107.0 | 1097.0 | 1069.0 | 1040.9 | 1030.9 |
| 52.5°  | 1030.9 | 1016.9 | 991.0  | 968.9  | 954.9  |
| 55°    | 953.0  | 940.8  | 916.9  | 892.9  | 882.9  |
| 57.5°  | 874.9  | 864.9  | 838.7  | 814.8  | 806.6  |
| 60°    | 796.7  | 788.8  | 760.8  | 738.7  | 732.7  |
| 62.5°  | 720.6  | 706.6  | 686.6  | 666.6  | 658.6  |
| 65°    | 642.7  | 630.6  | 610.6  | 592.5  | 582.6  |
| 67.5°  | 562.6  | 552.4  | 534.6  | 520.6  | 512.5  |
| 70°    | 488.5  | 480.5  | 462.4  | 448.4  | 440.5  |
| 72.5°  | 412.4  | 404.4  | 394.4  | 380.4  | 374.4  |
| 75°    | 336.2  | 332.4  | 322.2  | 310.3  | 314.3  |
| 77.5°  | 268.2  | 260.2  | 256.1  | 250.2  | 244.2  |
| 80°    | 200.3  | 198.1  | 194.1  | 188.2  | 184.1  |
| 82.5°  | 136.2  | 136.2  | 134.2  | 126.2  | 126.2  |
| 85°    | 81.9   | 80.1   | 78.1   | 72.0   | 70.1   |
| 87.5°  | 36.1   | 32.1   | 28.0   | 22.1   | 20.0   |
| 90°    | 2.1    | 24.5   | 66.7   | 62.6   | 64.6   |
| 92.5°  | 42.2   | 57.2   | 59.2   | 61.2   | 61.2   |
| 95°    | 99.3   | 118.3  | 121.7  | 121.7  | 118.3  |
| 97.5°  | 165.3  | 183.0  | 190.5  | 190.5  | 190.5  |
| 100°   | 241.5  | 257.1  | 262.5  | 262.5  | 260.5  |
| 102.5° | 321.7  | 333.3  | 340.7  | 342.8  | 340.7  |
| 105°   | 409.5  | 414.9  | 419.0  | 422.4  | 422.4  |
| 107.5° | 496.5  | 504.7  | 504.7  | 506.0  | 496.5  |
| 110°   | 580.9  | 591.7  | 591.7  | 591.7  | 586.3  |

TEST NUMBER: P922148

CATALOG NUMBER: DFN2DIP-PN3F0-060D080US940-FLLFLL

**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 672.0  | 683.6  | 681.5  | 676.1  | 672.0  |
| 115°   | 761.8  | 772.7  | 769.3  | 767.2  | 761.8  |
| 117.5° | 850.9  | 865.9  | 856.3  | 850.9  | 845.4  |
| 120°   | 940.7  | 955.6  | 940.7  | 940.7  | 934.5  |
| 122.5° | 1022.3 | 1041.3 | 1031.8 | 1026.4 | 1022.3 |
| 125°   | 1108.0 | 1125.0 | 1119.5 | 1113.4 | 1111.4 |
| 127.5° | 1191.7 | 1212.7 | 1205.2 | 1197.1 | 1191.7 |
| 130°   | 1269.9 | 1294.3 | 1290.9 | 1286.9 | 1279.4 |
| 132.5° | 1357.6 | 1376.6 | 1378.0 | 1368.5 | 1363.1 |
| 135°   | 1433.1 | 1454.2 | 1458.3 | 1456.3 | 1450.8 |
| 137.5° | 1517.4 | 1534.5 | 1537.8 | 1536.5 | 1528.3 |
| 140°   | 1591.6 | 1608.6 | 1618.1 | 1618.1 | 1610.6 |
| 142.5° | 1667.8 | 1684.8 | 1690.2 | 1692.3 | 1684.8 |
| 145°   | 1739.9 | 1753.5 | 1764.3 | 1766.4 | 1758.9 |
| 147.5° | 1804.5 | 1821.5 | 1829.6 | 1833.1 | 1825.6 |
| 150°   | 1871.2 | 1882.7 | 1890.2 | 1896.3 | 1890.2 |
| 152.5° | 1930.3 | 1941.9 | 1951.4 | 1958.9 | 1951.4 |
| 155°   | 1989.5 | 1994.9 | 2001.1 | 2010.5 | 2004.5 |
| 157.5° | 2040.5 | 2044.6 | 2048.0 | 2061.5 | 2052.1 |
| 160°   | 2086.1 | 2090.2 | 2092.2 | 2103.7 | 2095.6 |
| 162.5° | 2128.2 | 2128.2 | 2130.3 | 2143.2 | 2133.7 |
| 165°   | 2164.3 | 2162.2 | 2162.2 | 2175.9 | 2166.3 |
| 167.5° | 2196.9 | 2190.8 | 2190.8 | 2204.4 | 2194.9 |
| 170°   | 2221.4 | 2216.0 | 2213.9 | 2227.6 | 2216.0 |
| 172.5° | 2238.5 | 2233.0 | 2231.0 | 2244.5 | 2233.0 |
| 175°   | 2252.0 | 2246.6 | 2242.5 | 2256.1 | 2244.5 |
| 177.5° | 2259.5 | 2254.1 | 2250.0 | 2261.6 | 2250.0 |
| 180°   | 2256.1 | 2256.1 | 2256.1 | 2256.1 | 2256.1 |

TEST NUMBER: P922148

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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 | 9.91             | 10.73 | 10.90 | 11.74 | 13.07 | 9.47           | 10.29 | 10.46 | 11.30 | 12.63 |
|                 | 3H   | 11.56            | 12.30 | 12.56 | 13.31 | 14.66 | 11.08          | 11.82 | 12.08 | 12.83 | 14.18 |
|                 | 4H   | 12.14            | 12.84 | 13.16 | 13.86 | 15.22 | 11.66          | 12.36 | 12.67 | 13.37 | 14.73 |
|                 | 6H   | 12.53            | 13.18 | 13.56 | 14.20 | 15.57 | 12.04          | 12.69 | 13.07 | 13.71 | 15.08 |
|                 | 8H   | 12.64            | 13.25 | 13.67 | 14.29 | 15.66 | 12.15          | 12.76 | 13.18 | 13.80 | 15.17 |
|                 | 12H  | 12.68            | 13.26 | 13.72 | 14.30 | 15.69 | 12.18          | 12.77 | 13.22 | 13.80 | 15.19 |
| 4H              | 2H   | 10.36            | 11.06 | 11.38 | 12.08 | 13.44 | 10.01          | 10.71 | 11.03 | 11.73 | 13.09 |
|                 | 3H   | 12.22            | 12.80 | 13.25 | 13.85 | 15.22 | 11.82          | 12.40 | 12.85 | 13.44 | 14.82 |
|                 | 4H   | 12.92            | 13.46 | 13.96 | 14.50 | 15.89 | 12.51          | 13.04 | 13.55 | 14.08 | 15.48 |
|                 | 6H   | 13.43            | 13.89 | 14.48 | 14.95 | 16.34 | 13.01          | 13.47 | 14.06 | 14.53 | 15.92 |
|                 | 8H   | 13.58            | 14.01 | 14.63 | 15.06 | 16.47 | 13.15          | 13.58 | 14.20 | 14.63 | 16.04 |
|                 | 12H  | 13.65            | 14.03 | 14.71 | 15.10 | 16.51 | 13.21          | 13.60 | 14.28 | 14.66 | 16.08 |
| 8H              | 4H   | 13.11            | 13.54 | 14.16 | 14.60 | 16.00 | 12.74          | 13.17 | 13.79 | 14.23 | 15.63 |
|                 | 6H   | 13.74            | 14.09 | 14.81 | 15.19 | 16.59 | 13.36          | 13.72 | 14.43 | 14.81 | 16.22 |
|                 | 8H   | 13.95            | 14.26 | 15.03 | 15.34 | 16.77 | 13.57          | 13.88 | 14.65 | 14.96 | 16.38 |
|                 | 12H  | 14.08            | 14.35 | 15.16 | 15.43 | 16.89 | 13.68          | 13.95 | 14.76 | 15.03 | 16.49 |
| 12H             | 4H   | 13.10            | 13.49 | 14.16 | 14.55 | 15.97 | 12.73          | 13.12 | 13.80 | 14.19 | 15.60 |
|                 | 6H   | 13.76            | 14.08 | 14.84 | 15.16 | 16.58 | 13.40          | 13.71 | 14.48 | 14.79 | 16.22 |
|                 | 8H   | 14.00            | 14.27 | 15.08 | 15.35 | 16.81 | 13.63          | 13.90 | 14.71 | 14.98 | 16.44 |