

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: P927023

Luminaire Tested: DFN2DIP-HX4F0-080D060US830-FLLFLL

Issue Date: 12/12/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P927023  
REPORT IS A COMBINATION OF REPORTS P899343 AND P896187  
Test Lab: INNOVATION CENTER  
Issue Date: 12/12/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX4F0-080D060US830-FLLFLL  
Description: 4 foot, Hexagon Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

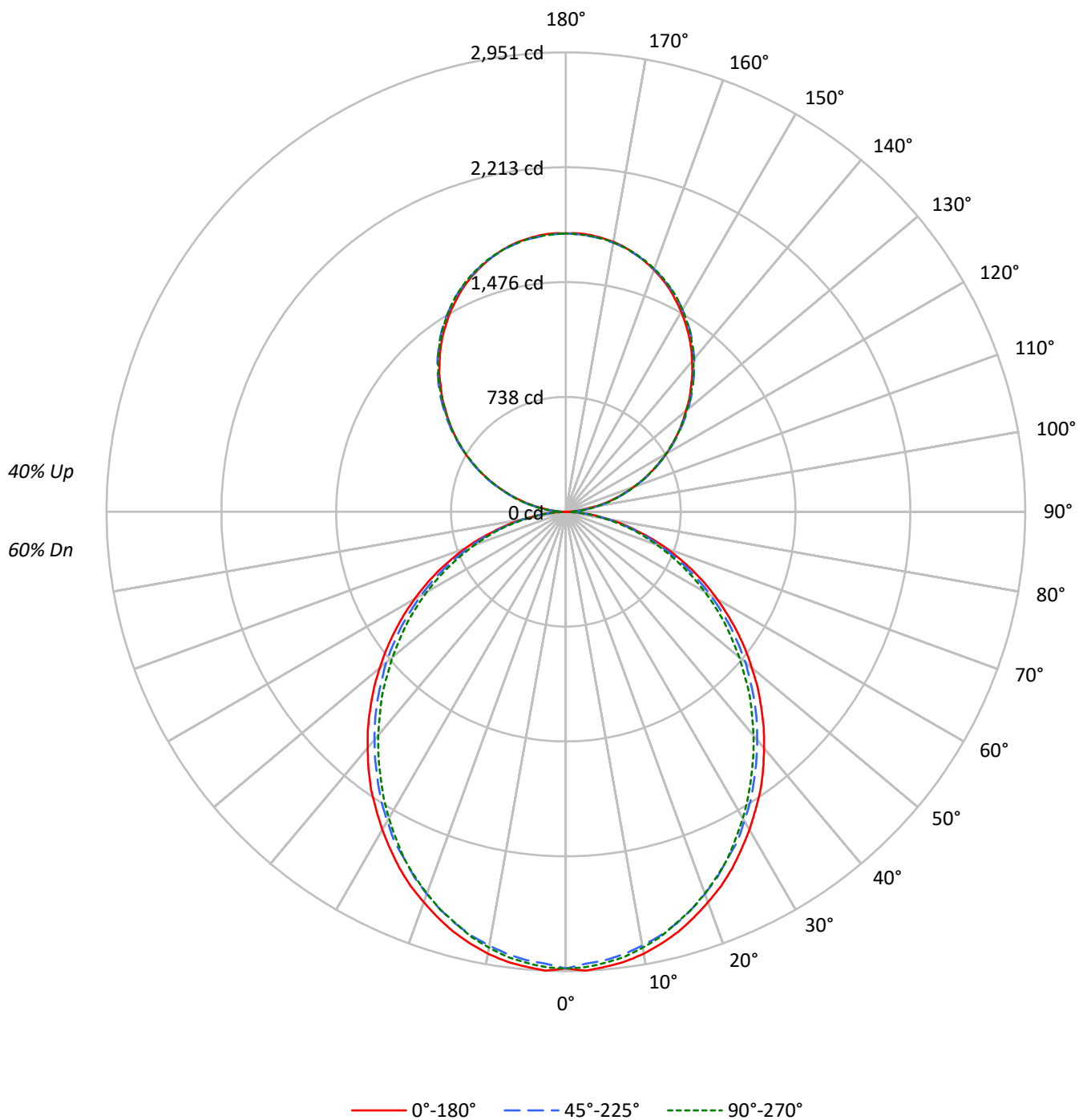
Lumens per Lamp: N/A  
Luminaire Lumens: 12469.3 lumens  
Efficiency: N/A  
Efficacy: 103.3 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.54' x L: 4.09' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 120.7  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9613  
Total Harmonic Distortion (THDi): 0.083  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

TEST NUMBER: P927023

CATALOG NUMBER: DFN2DIP-HX4F0-080D060US830-FLLFLL

### Luminous Intensity Polar Plot



TEST NUMBER: P927023

CATALOG NUMBER: DFN2DIP-HX4F0-080D060US830-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   | 110 | 110 | 110 | 110 | 102 | 102 | 102 | 102 | 89 | 89 | 89 | 77 | 77 | 77 | 65 | 65 | 65 |
| 1   | 100 | 96  | 92  | 88  | 93  | 89  | 86  | 83  | 78 | 75 | 73 | 67 | 66 | 64 | 58 | 56 | 55 |
| 2   | 91  | 84  | 77  | 72  | 85  | 78  | 73  | 68  | 68 | 64 | 61 | 59 | 56 | 53 | 51 | 48 | 46 |
| 3   | 83  | 73  | 66  | 60  | 77  | 69  | 62  | 57  | 60 | 55 | 51 | 52 | 48 | 45 | 45 | 42 | 40 |
| 4   | 76  | 65  | 57  | 51  | 71  | 61  | 54  | 48  | 54 | 48 | 43 | 47 | 42 | 39 | 40 | 37 | 34 |
| 5   | 70  | 58  | 50  | 44  | 65  | 55  | 47  | 42  | 48 | 42 | 38 | 42 | 37 | 34 | 36 | 33 | 30 |
| 6   | 64  | 52  | 44  | 38  | 60  | 49  | 42  | 36  | 43 | 37 | 33 | 38 | 33 | 29 | 33 | 29 | 26 |
| 7   | 60  | 47  | 39  | 33  | 56  | 44  | 37  | 32  | 39 | 33 | 29 | 35 | 30 | 26 | 30 | 26 | 23 |
| 8   | 55  | 43  | 35  | 30  | 52  | 40  | 33  | 28  | 36 | 30 | 26 | 32 | 27 | 23 | 28 | 24 | 21 |
| 9   | 52  | 39  | 32  | 26  | 48  | 37  | 30  | 25  | 33 | 27 | 23 | 29 | 24 | 21 | 26 | 22 | 19 |
| 10  | 48  | 36  | 29  | 24  | 45  | 34  | 27  | 23  | 30 | 25 | 21 | 27 | 22 | 19 | 24 | 20 | 17 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2181 | 2181 | 2181 |
| 5°  | 2185 | 2151 | 2166 |
| 10° | 2168 | 2123 | 2137 |
| 15° | 2136 | 2088 | 2091 |
| 20° | 2093 | 2039 | 2044 |
| 25° | 2050 | 1982 | 1990 |
| 30° | 1997 | 1928 | 1921 |
| 35° | 1946 | 1864 | 1848 |
| 40° | 1884 | 1800 | 1779 |
| 45° | 1822 | 1736 | 1708 |
| 50° | 1753 | 1668 | 1626 |
| 55° | 1682 | 1591 | 1550 |
| 60° | 1602 | 1498 | 1464 |
| 65° | 1514 | 1402 | 1362 |
| 70° | 1402 | 1285 | 1252 |
| 75° | 1247 | 1145 | 1151 |
| 80° | 1062 | 967  | 958  |
| 85° | 771  | 659  | 637  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
Vertical Angle: 45°  
Luminance: 1822 cd/sqm

TEST NUMBER: P927023

CATALOG NUMBER: DFN2DIP-HX4F0-080D060US830-FLLFLL

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 276.1   | 2.2       |
| 10°-20°   | 776.9   | 6.2       |
| 20°-30°   | 1141.8  | 9.2       |
| 30°-40°   | 1326.1  | 10.6      |
| 40°-50°   | 1324.5  | 10.6      |
| 50°-60°   | 1154.9  | 9.3       |
| 60°-70°   | 853.7   | 6.8       |
| 70°-80°   | 483.0   | 3.9       |
| 80°-90°   | 132.6   | 1.1       |
| 90°-100°  | 110.7   | 0.9       |
| 100°-110° | 351.6   | 2.8       |
| 110°-120° | 601.7   | 4.8       |
| 120°-130° | 791.4   | 6.3       |
| 130°-140° | 888.3   | 7.1       |
| 140°-150° | 871.1   | 7.0       |
| 150°-160° | 730.7   | 5.9       |
| 160°-170° | 484.6   | 3.9       |
| 170°-180° | 169.4   | 1.4       |
| 0°-30°    | 2194.9  | 17.6      |
| 0°-40°    | 3521.0  | 28.2      |
| 0°-60°    | 6000.4  | 48.1      |
| 0°-90°    | 7469.7  | 59.9      |
| 90°-120°  | 1064.0  | 8.5       |
| 90°-150°  | 3614.9  | 29.0      |
| 90°-180°  | 5000.0  | 40.1      |
| 0°-180°   | 12469.3 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2934 | 2934  | 2934 | 2934  | 2934 |      |
| 5°   | 2934 | 2923  | 2892 | 2914  | 2909 | 278  |
| 15°  | 2793 | 2776  | 2739 | 2751  | 2737 | 787  |
| 25°  | 2528 | 2505  | 2457 | 2463  | 2457 | 1163 |
| 35°  | 2181 | 2153  | 2107 | 2090  | 2076 | 1362 |
| 45°  | 1775 | 1755  | 1712 | 1682  | 1670 | 1370 |
| 55°  | 1343 | 1326  | 1292 | 1258  | 1244 | 1201 |
| 65°  | 906  | 889   | 860  | 835   | 821  | 895  |
| 75°  | 474  | 468   | 454  | 437   | 443  | 506  |
| 85°  | 116  | 113   | 110  | 102   | 99   | 129  |
| 90°  | 2    | 19    | 53   | 50    | 51   | 12   |
| 95°  | 79   | 94    | 96   | 96    | 94   | 88   |
| 105° | 325  | 329   | 332  | 335   | 335  | 343  |
| 115° | 604  | 612   | 610  | 608   | 604  | 597  |
| 125° | 878  | 892   | 888  | 883   | 881  | 785  |
| 135° | 1136 | 1153  | 1156 | 1154  | 1150 | 878  |
| 145° | 1379 | 1390  | 1399 | 1400  | 1394 | 862  |
| 155° | 1577 | 1581  | 1586 | 1594  | 1589 | 726  |
| 165° | 1716 | 1714  | 1714 | 1725  | 1717 | 484  |
| 175° | 1785 | 1781  | 1778 | 1788  | 1779 | 170  |
| 180° | 1788 | 1788  | 1788 | 1788  | 1788 |      |

TEST NUMBER: P927023

CATALOG NUMBER: DFN2DIP-HX4F0-080D060US830-FLLFL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2933.8 | 2933.8 | 2933.8 | 2933.8 | 2933.8 |
| 2.5°   | 2950.9 | 2936.8 | 2905.7 | 2933.8 | 2928.4 |
| 5°     | 2933.8 | 2922.8 | 2891.7 | 2914.1 | 2908.7 |
| 7.5°   | 2914.1 | 2897.3 | 2866.2 | 2889.0 | 2883.3 |
| 10°    | 2883.3 | 2863.5 | 2829.7 | 2852.1 | 2843.8 |
| 12.5°  | 2840.8 | 2824.0 | 2790.2 | 2804.2 | 2798.6 |
| 15°    | 2792.9 | 2776.1 | 2739.3 | 2750.7 | 2736.6 |
| 17.5°  | 2733.6 | 2716.9 | 2680.0 | 2694.1 | 2680.0 |
| 20°    | 2668.7 | 2651.9 | 2612.4 | 2620.8 | 2609.7 |
| 22.5°  | 2604.0 | 2578.6 | 2541.7 | 2541.7 | 2536.1 |
| 25°    | 2527.7 | 2505.3 | 2457.4 | 2462.8 | 2457.4 |
| 27.5°  | 2443.0 | 2423.3 | 2386.7 | 2378.3 | 2364.3 |
| 30°    | 2358.6 | 2335.8 | 2293.7 | 2285.3 | 2273.9 |
| 32.5°  | 2268.2 | 2251.4 | 2206.2 | 2189.1 | 2177.8 |
| 35°    | 2180.8 | 2152.7 | 2107.4 | 2090.4 | 2076.3 |
| 37.5°  | 2082.0 | 2056.5 | 2011.4 | 1991.6 | 1977.6 |
| 40°    | 1980.6 | 1957.8 | 1912.6 | 1887.5 | 1876.0 |
| 42.5°  | 1881.8 | 1859.0 | 1814.1 | 1785.7 | 1769.0 |
| 45°    | 1774.6 | 1754.8 | 1712.3 | 1681.5 | 1670.2 |
| 47.5°  | 1670.2 | 1650.4 | 1605.2 | 1574.1 | 1557.3 |
| 50°    | 1560.0 | 1546.0 | 1506.4 | 1466.9 | 1452.9 |
| 52.5°  | 1452.9 | 1433.1 | 1396.6 | 1365.5 | 1345.7 |
| 55°    | 1343.0 | 1325.9 | 1292.2 | 1258.3 | 1244.2 |
| 57.5°  | 1232.9 | 1218.8 | 1182.0 | 1148.2 | 1136.7 |
| 60°    | 1122.7 | 1111.7 | 1072.1 | 1041.0 | 1032.6 |
| 62.5°  | 1015.5 | 995.8  | 967.7  | 939.6  | 928.2  |
| 65°    | 905.7  | 888.7  | 860.5  | 835.1  | 821.0  |
| 67.5°  | 792.8  | 778.5  | 753.3  | 733.6  | 722.2  |
| 70°    | 688.4  | 677.0  | 651.6  | 631.9  | 620.7  |
| 72.5°  | 581.2  | 569.9  | 555.8  | 536.1  | 527.7  |
| 75°    | 473.8  | 468.4  | 454.1  | 437.3  | 443.0  |
| 77.5°  | 378.0  | 366.6  | 361.0  | 352.6  | 344.2  |
| 80°    | 282.3  | 279.3  | 273.6  | 265.2  | 259.5  |
| 82.5°  | 191.9  | 191.9  | 189.2  | 177.8  | 177.8  |
| 85°    | 115.6  | 112.8  | 110.2  | 101.5  | 98.8   |
| 87.5°  | 50.9   | 45.2   | 39.5   | 31.1   | 28.2   |
| 90°    | 1.6    | 19.4   | 52.9   | 49.6   | 51.2   |
| 92.5°  | 33.5   | 45.3   | 46.9   | 48.5   | 48.5   |
| 95°    | 78.7   | 93.8   | 96.5   | 96.5   | 93.8   |
| 97.5°  | 131.0  | 145.1  | 151.0  | 151.0  | 151.0  |
| 100°   | 191.4  | 203.8  | 208.1  | 208.1  | 206.5  |
| 102.5° | 255.0  | 264.2  | 270.1  | 271.7  | 270.1  |
| 105°   | 324.6  | 328.9  | 332.1  | 334.9  | 334.9  |
| 107.5° | 393.6  | 400.1  | 400.1  | 401.1  | 393.6  |
| 110°   | 460.5  | 469.1  | 469.1  | 469.1  | 464.7  |

TEST NUMBER: P927023

CATALOG NUMBER: DFN2DIP-HX4F0-080D060US830-FLLFLL

**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 532.7  | 541.8  | 540.2  | 535.9  | 532.7  |
| 115°   | 603.9  | 612.5  | 609.8  | 608.2  | 603.9  |
| 117.5° | 674.5  | 686.4  | 678.8  | 674.5  | 670.2  |
| 120°   | 745.7  | 757.6  | 745.7  | 745.7  | 740.8  |
| 122.5° | 810.4  | 825.4  | 817.9  | 813.7  | 810.4  |
| 125°   | 878.3  | 891.8  | 887.5  | 882.7  | 881.0  |
| 127.5° | 944.7  | 961.4  | 955.4  | 949.0  | 944.7  |
| 130°   | 1006.7 | 1026.1 | 1023.4 | 1020.2 | 1014.2 |
| 132.5° | 1076.2 | 1091.3 | 1092.4 | 1084.8 | 1080.5 |
| 135°   | 1136.1 | 1152.8 | 1156.0 | 1154.4 | 1150.0 |
| 137.5° | 1202.9 | 1216.4 | 1219.1 | 1218.0 | 1211.6 |
| 140°   | 1261.7 | 1275.2 | 1282.7 | 1282.7 | 1276.8 |
| 142.5° | 1322.0 | 1335.5 | 1339.9 | 1341.5 | 1335.5 |
| 145°   | 1379.3 | 1390.0 | 1398.7 | 1400.3 | 1394.3 |
| 147.5° | 1430.4 | 1443.9 | 1450.4 | 1453.1 | 1447.1 |
| 150°   | 1483.3 | 1492.4 | 1498.4 | 1503.2 | 1498.4 |
| 152.5° | 1530.1 | 1539.4 | 1546.9 | 1552.9 | 1546.9 |
| 155°   | 1577.1 | 1581.4 | 1586.2 | 1593.9 | 1589.0 |
| 157.5° | 1617.5 | 1620.8 | 1623.5 | 1634.3 | 1626.8 |
| 160°   | 1653.7 | 1656.9 | 1658.5 | 1667.7 | 1661.3 |
| 162.5° | 1687.1 | 1687.1 | 1688.7 | 1699.0 | 1691.4 |
| 165°   | 1715.6 | 1714.0 | 1714.0 | 1724.9 | 1717.3 |
| 167.5° | 1741.6 | 1736.7 | 1736.7 | 1747.5 | 1739.9 |
| 170°   | 1761.0 | 1756.6 | 1755.0 | 1765.8 | 1756.6 |
| 172.5° | 1774.4 | 1770.1 | 1768.5 | 1779.3 | 1770.1 |
| 175°   | 1785.2 | 1780.9 | 1777.6 | 1788.5 | 1779.3 |
| 177.5° | 1791.1 | 1786.9 | 1783.6 | 1792.7 | 1783.6 |
| 180°   | 1788.5 | 1788.5 | 1788.5 | 1788.5 | 1788.5 |

TEST NUMBER: P927023

CATALOG NUMBER: DFN2DIP-HX4F0-080D060US830-FLLFLL

**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 | 10.85            | 11.81 | 11.72 | 12.70 | 13.82 | 10.42          | 11.37 | 11.28 | 12.26 | 13.39 |
|                 | 3H   | 12.52            | 13.38 | 13.40 | 14.27 | 15.42 | 12.04          | 12.90 | 12.92 | 13.80 | 14.95 |
|                 | 4H   | 13.11            | 13.92 | 14.00 | 14.83 | 15.98 | 12.64          | 13.45 | 13.53 | 14.35 | 15.51 |
|                 | 6H   | 13.52            | 14.26 | 14.42 | 15.18 | 16.35 | 13.04          | 13.79 | 13.95 | 14.70 | 15.87 |
|                 | 8H   | 13.62            | 14.34 | 14.54 | 15.27 | 16.44 | 13.15          | 13.86 | 14.06 | 14.79 | 15.96 |
|                 | 12H  | 13.68            | 14.36 | 14.60 | 15.28 | 16.47 | 13.19          | 13.87 | 14.11 | 14.80 | 15.99 |
| 4H              | 2H   | 11.32            | 12.14 | 12.22 | 13.04 | 14.20 | 10.98          | 11.79 | 11.88 | 12.69 | 13.85 |
|                 | 3H   | 13.20            | 13.88 | 14.11 | 14.81 | 15.99 | 12.81          | 13.48 | 13.72 | 14.42 | 15.59 |
|                 | 4H   | 13.92            | 14.54 | 14.84 | 15.47 | 16.67 | 13.51          | 14.13 | 14.43 | 15.06 | 16.26 |
|                 | 6H   | 14.44            | 14.97 | 15.37 | 15.93 | 17.13 | 14.03          | 14.56 | 14.97 | 15.52 | 16.72 |
|                 | 8H   | 14.59            | 15.09 | 15.53 | 16.04 | 17.25 | 14.18          | 14.68 | 15.12 | 15.63 | 16.84 |
|                 | 12H  | 14.67            | 15.12 | 15.63 | 16.09 | 17.31 | 14.25          | 14.70 | 15.21 | 15.66 | 16.88 |
| 8H              | 4H   | 14.12            | 14.62 | 15.06 | 15.57 | 16.78 | 13.76          | 14.26 | 14.70 | 15.21 | 16.42 |
|                 | 6H   | 14.76            | 15.17 | 15.72 | 16.16 | 17.37 | 14.40          | 14.81 | 15.36 | 15.80 | 17.01 |
|                 | 8H   | 14.98            | 15.35 | 15.96 | 16.33 | 17.56 | 14.61          | 14.98 | 15.59 | 15.96 | 17.19 |
|                 | 12H  | 15.12            | 15.44 | 16.10 | 16.41 | 17.69 | 14.73          | 15.06 | 15.71 | 16.03 | 17.31 |
| 12H             | 4H   | 14.11            | 14.56 | 15.07 | 15.53 | 16.75 | 13.76          | 14.21 | 14.72 | 15.18 | 16.40 |
|                 | 6H   | 14.79            | 15.16 | 15.76 | 16.14 | 17.37 | 14.44          | 14.80 | 15.41 | 15.78 | 17.01 |
|                 | 8H   | 15.04            | 15.36 | 16.02 | 16.33 | 17.61 | 14.68          | 15.00 | 15.66 | 15.98 | 17.25 |