

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: P926995

Luminaire Tested: DFN2DIP-HX4F0-070D080US830-FLLFLL

Issue Date: 12/12/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P926995  
REPORT IS A COMBINATION OF REPORTS P899377 AND P896187  
Test Lab: INNOVATION CENTER  
Issue Date: 12/12/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX4F0-070D080US830-FLLFLL  
Description: 4 foot, Hexagon Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

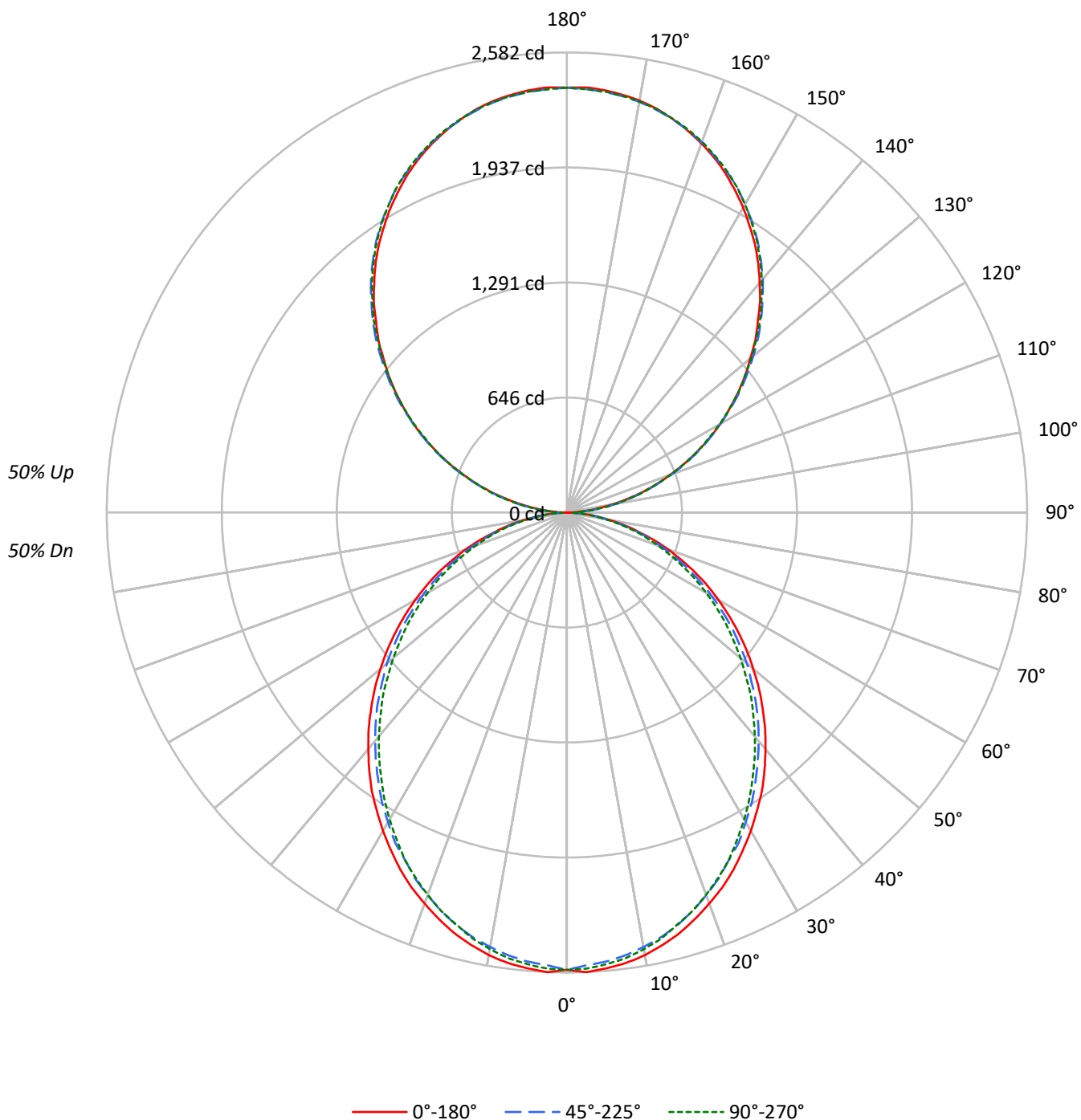
Lumens per Lamp: N/A  
Luminaire Lumens: 13204.5 lumens  
Efficiency: N/A  
Efficacy: 106.0 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.54' x L: 4.09' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 124.6  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9972  
Total Harmonic Distortion (THDi): 0.128  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

TEST NUMBER: P926995

CATALOG NUMBER: DFN2DIP-HX4F0-070D080US830-FLLFLL

### Luminous Intensity Polar Plot



TEST NUMBER: P926995

CATALOG NUMBER: DFN2DIP-HX4F0-070D080US830-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   | 107 | 107 | 107 | 107 | 99 | 99 | 99 | 99 | 83 | 83 | 83 | 69 | 69 | 69 | 56 | 56 | 56 |
| 1   | 98  | 93  | 89  | 86  | 90 | 86 | 83 | 80 | 73 | 70 | 68 | 61 | 59 | 57 | 49 | 48 | 47 |
| 2   | 89  | 82  | 75  | 70  | 82 | 75 | 70 | 66 | 64 | 60 | 56 | 53 | 50 | 48 | 43 | 41 | 40 |
| 3   | 81  | 72  | 64  | 58  | 74 | 66 | 60 | 55 | 56 | 51 | 47 | 47 | 43 | 40 | 38 | 36 | 34 |
| 4   | 74  | 63  | 56  | 49  | 68 | 59 | 52 | 46 | 50 | 45 | 40 | 42 | 38 | 35 | 34 | 31 | 29 |
| 5   | 68  | 57  | 48  | 42  | 63 | 52 | 45 | 40 | 45 | 39 | 35 | 38 | 33 | 30 | 31 | 28 | 25 |
| 6   | 63  | 51  | 43  | 37  | 58 | 47 | 40 | 35 | 40 | 35 | 30 | 34 | 30 | 26 | 28 | 25 | 22 |
| 7   | 58  | 46  | 38  | 32  | 53 | 43 | 35 | 30 | 37 | 31 | 27 | 31 | 27 | 23 | 26 | 22 | 20 |
| 8   | 54  | 42  | 34  | 28  | 50 | 39 | 32 | 27 | 33 | 28 | 24 | 28 | 24 | 21 | 24 | 20 | 18 |
| 9   | 50  | 38  | 30  | 25  | 46 | 35 | 29 | 24 | 31 | 25 | 21 | 26 | 22 | 19 | 22 | 18 | 16 |
| 10  | 47  | 35  | 28  | 23  | 43 | 33 | 26 | 22 | 28 | 23 | 19 | 24 | 20 | 17 | 20 | 17 | 15 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1909 | 1909 | 1909 |
| 5°  | 1912 | 1882 | 1895 |
| 10° | 1897 | 1857 | 1869 |
| 15° | 1869 | 1827 | 1829 |
| 20° | 1831 | 1785 | 1789 |
| 25° | 1794 | 1734 | 1741 |
| 30° | 1747 | 1687 | 1681 |
| 35° | 1703 | 1631 | 1617 |
| 40° | 1648 | 1575 | 1557 |
| 45° | 1594 | 1519 | 1494 |
| 50° | 1534 | 1460 | 1423 |
| 55° | 1472 | 1392 | 1357 |
| 60° | 1402 | 1311 | 1281 |
| 65° | 1325 | 1227 | 1192 |
| 70° | 1227 | 1124 | 1096 |
| 75° | 1091 | 1002 | 1008 |
| 80° | 928  | 846  | 838  |
| 85° | 674  | 577  | 557  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 1798 cd/sqm

TEST NUMBER: P926995

CATALOG NUMBER: DFN2DIP-HX4F0-070D080US830-FLLFLL

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 241.6   | 1.8       |
| 10°-20°   | 679.8   | 5.1       |
| 20°-30°   | 999.1   | 7.6       |
| 30°-40°   | 1160.4  | 8.8       |
| 40°-50°   | 1158.9  | 8.8       |
| 50°-60°   | 1010.5  | 7.7       |
| 60°-70°   | 747.0   | 5.7       |
| 70°-80°   | 422.7   | 3.2       |
| 80°-90°   | 118.3   | 0.9       |
| 90°-100°  | 147.6   | 1.1       |
| 100°-110° | 468.9   | 3.6       |
| 110°-120° | 802.3   | 6.1       |
| 120°-130° | 1055.2  | 8.0       |
| 130°-140° | 1184.4  | 9.0       |
| 140°-150° | 1161.5  | 8.8       |
| 150°-160° | 974.3   | 7.4       |
| 160°-170° | 646.1   | 4.9       |
| 170°-180° | 225.8   | 1.7       |
| 0°-30°    | 1920.5  | 14.5      |
| 0°-40°    | 3080.9  | 23.3      |
| 0°-60°    | 5250.3  | 39.8      |
| 0°-90°    | 6538.3  | 49.5      |
| 90°-120°  | 1418.8  | 10.7      |
| 90°-150°  | 4819.9  | 36.5      |
| 90°-180°  | 6666.0  | 50.5      |
| 0°-180°   | 13204.5 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2567 | 2567  | 2567 | 2567  | 2567 |      |
| 5°   | 2567 | 2558  | 2530 | 2550  | 2545 | 244  |
| 15°  | 2444 | 2429  | 2397 | 2407  | 2394 | 688  |
| 25°  | 2212 | 2192  | 2150 | 2155  | 2150 | 1018 |
| 35°  | 1908 | 1884  | 1844 | 1829  | 1817 | 1192 |
| 45°  | 1553 | 1536  | 1498 | 1471  | 1461 | 1198 |
| 55°  | 1175 | 1160  | 1131 | 1101  | 1089 | 1051 |
| 65°  | 792  | 778   | 753  | 731   | 718  | 784  |
| 75°  | 415  | 410   | 397  | 383   | 388  | 443  |
| 85°  | 101  | 99    | 96   | 89    | 86   | 113  |
| 90°  | 2    | 26    | 70   | 66    | 68   | 13   |
| 95°  | 105  | 125   | 129  | 129   | 125  | 117  |
| 105° | 433  | 438   | 443  | 446   | 446  | 457  |
| 115° | 805  | 817   | 813  | 811   | 805  | 796  |
| 125° | 1171 | 1189  | 1183 | 1177  | 1175 | 1047 |
| 135° | 1515 | 1537  | 1541 | 1539  | 1533 | 1171 |
| 145° | 1839 | 1853  | 1865 | 1867  | 1859 | 1149 |
| 155° | 2103 | 2109  | 2115 | 2125  | 2119 | 968  |
| 165° | 2288 | 2285  | 2285 | 2300  | 2290 | 645  |
| 175° | 2380 | 2374  | 2370 | 2385  | 2372 | 226  |
| 180° | 2385 | 2385  | 2385 | 2385  | 2385 |      |

TEST NUMBER: P926995

CATALOG NUMBER: DFN2DIP-HX4F0-070D080US830-FLLFLL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2567.1 | 2567.1 | 2567.1 | 2567.1 | 2567.1 |
| 2.5°   | 2582.1 | 2569.7 | 2542.5 | 2567.1 | 2562.4 |
| 5°     | 2567.1 | 2557.5 | 2530.2 | 2549.8 | 2545.1 |
| 7.5°   | 2549.8 | 2535.1 | 2507.9 | 2527.9 | 2522.9 |
| 10°    | 2522.9 | 2505.5 | 2475.9 | 2495.6 | 2488.3 |
| 12.5°  | 2485.7 | 2471.0 | 2441.5 | 2453.7 | 2448.7 |
| 15°    | 2443.8 | 2429.1 | 2396.9 | 2406.9 | 2394.5 |
| 17.5°  | 2391.9 | 2377.3 | 2345.0 | 2357.4 | 2345.0 |
| 20°    | 2335.0 | 2320.4 | 2285.8 | 2293.2 | 2283.5 |
| 22.5°  | 2278.5 | 2256.3 | 2224.0 | 2224.0 | 2219.0 |
| 25°    | 2211.8 | 2192.1 | 2150.2 | 2154.9 | 2150.2 |
| 27.5°  | 2137.6 | 2120.3 | 2088.4 | 2081.0 | 2068.7 |
| 30°    | 2063.8 | 2043.8 | 2007.0 | 1999.6 | 1989.6 |
| 32.5°  | 1984.6 | 1970.0 | 1930.4 | 1915.5 | 1905.5 |
| 35°    | 1908.2 | 1883.6 | 1844.0 | 1829.1 | 1816.8 |
| 37.5°  | 1821.8 | 1799.5 | 1759.9 | 1742.7 | 1730.3 |
| 40°    | 1733.0 | 1713.1 | 1673.5 | 1651.5 | 1641.6 |
| 42.5°  | 1646.5 | 1626.7 | 1587.4 | 1562.5 | 1547.8 |
| 45°    | 1552.8 | 1535.5 | 1498.3 | 1471.3 | 1461.3 |
| 47.5°  | 1461.3 | 1444.1 | 1404.5 | 1377.3 | 1362.7 |
| 50°    | 1365.0 | 1352.7 | 1318.1 | 1283.6 | 1271.2 |
| 52.5°  | 1271.2 | 1254.0 | 1222.0 | 1194.8 | 1177.5 |
| 55°    | 1175.1 | 1160.2 | 1130.6 | 1101.0 | 1088.7 |
| 57.5°  | 1078.8 | 1066.4 | 1034.2 | 1004.6 | 994.7  |
| 60°    | 982.4  | 972.7  | 938.2  | 910.9  | 903.6  |
| 62.5°  | 888.6  | 871.3  | 846.7  | 822.1  | 812.2  |
| 65°    | 792.5  | 777.6  | 753.0  | 730.7  | 718.4  |
| 67.5°  | 693.8  | 681.2  | 659.2  | 641.9  | 631.9  |
| 70°    | 602.4  | 592.5  | 570.1  | 552.9  | 543.2  |
| 72.5°  | 508.6  | 498.7  | 486.3  | 469.1  | 461.7  |
| 75°    | 414.6  | 409.9  | 397.3  | 382.7  | 387.7  |
| 77.5°  | 330.8  | 320.8  | 315.8  | 308.5  | 301.2  |
| 80°    | 246.9  | 244.4  | 239.4  | 232.0  | 227.0  |
| 82.5°  | 167.9  | 167.9  | 165.5  | 155.6  | 155.6  |
| 85°    | 101.1  | 98.8   | 96.4   | 88.8   | 86.4   |
| 87.5°  | 44.5   | 39.6   | 34.6   | 27.2   | 24.6   |
| 90°    | 2.2    | 25.9   | 70.5   | 66.2   | 68.3   |
| 92.5°  | 44.6   | 60.4   | 62.6   | 64.7   | 64.7   |
| 95°    | 105.0  | 125.1  | 128.7  | 128.7  | 125.1  |
| 97.5°  | 174.7  | 193.4  | 201.3  | 201.3  | 201.3  |
| 100°   | 255.2  | 271.7  | 277.5  | 277.5  | 275.3  |
| 102.5° | 340.1  | 352.3  | 360.1  | 362.3  | 360.1  |
| 105°   | 432.8  | 438.5  | 442.9  | 446.5  | 446.5  |
| 107.5° | 524.8  | 533.5  | 533.5  | 534.9  | 524.8  |
| 110°   | 613.9  | 625.4  | 625.4  | 625.4  | 619.7  |

TEST NUMBER: P926995

CATALOG NUMBER: DFN2DIP-HX4F0-070D080US830-FLLFLL

**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 710.3  | 722.5  | 720.4  | 714.6  | 710.3  |
| 115°   | 805.2  | 816.7  | 813.1  | 810.9  | 805.2  |
| 117.5° | 899.3  | 915.2  | 905.1  | 899.3  | 893.6  |
| 120°   | 994.2  | 1010.1 | 994.2  | 994.2  | 987.7  |
| 122.5° | 1080.5 | 1100.7 | 1090.6 | 1084.8 | 1080.5 |
| 125°   | 1171.1 | 1189.1 | 1183.3 | 1176.8 | 1174.7 |
| 127.5° | 1259.6 | 1281.8 | 1273.9 | 1265.3 | 1259.6 |
| 130°   | 1342.2 | 1368.0 | 1364.5 | 1360.2 | 1352.3 |
| 132.5° | 1435.0 | 1455.0 | 1456.5 | 1446.5 | 1440.7 |
| 135°   | 1514.7 | 1537.0 | 1541.4 | 1539.2 | 1533.4 |
| 137.5° | 1603.9 | 1621.9 | 1625.4 | 1624.0 | 1615.4 |
| 140°   | 1682.3 | 1700.2 | 1710.3 | 1710.3 | 1702.3 |
| 142.5° | 1762.8 | 1780.8 | 1786.5 | 1788.7 | 1780.8 |
| 145°   | 1839.0 | 1853.3 | 1864.8 | 1867.0 | 1859.1 |
| 147.5° | 1907.2 | 1925.2 | 1933.8 | 1937.5 | 1929.6 |
| 150°   | 1977.7 | 1989.9 | 1997.8 | 2004.3 | 1997.8 |
| 152.5° | 2040.2 | 2052.5 | 2062.6 | 2070.5 | 2062.6 |
| 155°   | 2102.8 | 2108.6 | 2115.1 | 2125.1 | 2118.6 |
| 157.5° | 2156.7 | 2161.1 | 2164.6 | 2179.0 | 2169.0 |
| 160°   | 2204.9 | 2209.2 | 2211.4 | 2223.5 | 2215.0 |
| 162.5° | 2249.5 | 2249.5 | 2251.6 | 2265.3 | 2255.2 |
| 165°   | 2287.5 | 2285.4 | 2285.4 | 2299.8 | 2289.7 |
| 167.5° | 2322.0 | 2315.6 | 2315.6 | 2330.0 | 2319.9 |
| 170°   | 2348.0 | 2342.2 | 2340.0 | 2354.5 | 2342.2 |
| 172.5° | 2366.0 | 2360.2 | 2358.0 | 2372.4 | 2360.2 |
| 175°   | 2380.3 | 2374.5 | 2370.2 | 2384.6 | 2372.4 |
| 177.5° | 2388.2 | 2382.5 | 2378.1 | 2390.4 | 2378.1 |
| 180°   | 2384.6 | 2384.6 | 2384.6 | 2384.6 | 2384.6 |

TEST NUMBER: P926995

CATALOG NUMBER: DFN2DIP-HX4F0-070D080US830-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 | 9.47             | 10.33 | 10.43 | 11.31 | 12.58 | 9.04           | 9.90  | 10.00 | 10.87 | 12.15 |
|                 | 3H   | 11.13            | 11.90 | 12.11 | 12.89 | 14.19 | 10.66          | 11.43 | 11.63 | 12.41 | 13.71 |
|                 | 4H   | 11.72            | 12.45 | 12.71 | 13.44 | 14.75 | 11.25          | 11.98 | 12.23 | 12.96 | 14.27 |
|                 | 6H   | 12.12            | 12.79 | 13.12 | 13.79 | 15.11 | 11.65          | 12.32 | 12.64 | 13.31 | 14.63 |
|                 | 8H   | 12.23            | 12.87 | 13.23 | 13.88 | 15.19 | 11.75          | 12.39 | 12.75 | 13.40 | 14.72 |
|                 | 12H  | 12.28            | 12.88 | 13.28 | 13.89 | 15.23 | 11.79          | 12.40 | 12.80 | 13.41 | 14.75 |
| 4H              | 2H   | 9.93             | 10.66 | 10.93 | 11.65 | 12.96 | 9.59           | 10.32 | 10.58 | 11.31 | 12.61 |
|                 | 3H   | 11.80            | 12.41 | 12.80 | 13.43 | 14.75 | 11.41          | 12.02 | 12.41 | 13.03 | 14.36 |
|                 | 4H   | 12.52            | 13.07 | 13.53 | 14.08 | 15.43 | 12.11          | 12.67 | 13.12 | 13.68 | 15.02 |
|                 | 6H   | 13.03            | 13.51 | 14.05 | 14.54 | 15.89 | 12.62          | 13.10 | 13.64 | 14.13 | 15.48 |
|                 | 8H   | 13.18            | 13.63 | 14.20 | 14.66 | 16.01 | 12.77          | 13.22 | 13.79 | 14.24 | 15.60 |
|                 | 12H  | 13.26            | 13.66 | 14.30 | 14.70 | 16.06 | 12.83          | 13.24 | 13.87 | 14.28 | 15.64 |
| 8H              | 4H   | 12.71            | 13.16 | 13.73 | 14.19 | 15.54 | 12.35          | 12.80 | 13.37 | 13.83 | 15.18 |
|                 | 6H   | 13.35            | 13.72 | 14.39 | 14.78 | 16.14 | 12.98          | 13.35 | 14.03 | 14.42 | 15.78 |
|                 | 8H   | 13.57            | 13.89 | 14.62 | 14.95 | 16.32 | 13.20          | 13.52 | 14.25 | 14.58 | 15.95 |
|                 | 12H  | 13.70            | 13.99 | 14.76 | 15.03 | 16.45 | 13.31          | 13.60 | 14.37 | 14.65 | 16.07 |
| 12H             | 4H   | 12.70            | 13.10 | 13.74 | 14.14 | 15.51 | 12.35          | 12.75 | 13.39 | 13.79 | 15.16 |
|                 | 6H   | 13.38            | 13.70 | 14.43 | 14.76 | 16.13 | 13.02          | 13.35 | 14.08 | 14.40 | 15.78 |
|                 | 8H   | 13.62            | 13.90 | 14.68 | 14.95 | 16.37 | 13.26          | 13.55 | 14.32 | 14.60 | 16.01 |