

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: P916484

Luminaire Tested: DFN2DIP-HX4F0-120D110US930-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P916484  
REPORT IS A COMBINATION OF REPORTS P899441 AND P896188  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX4F0-120D110US930-FLLFLL  
Description: 4 foot, Hexagon Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

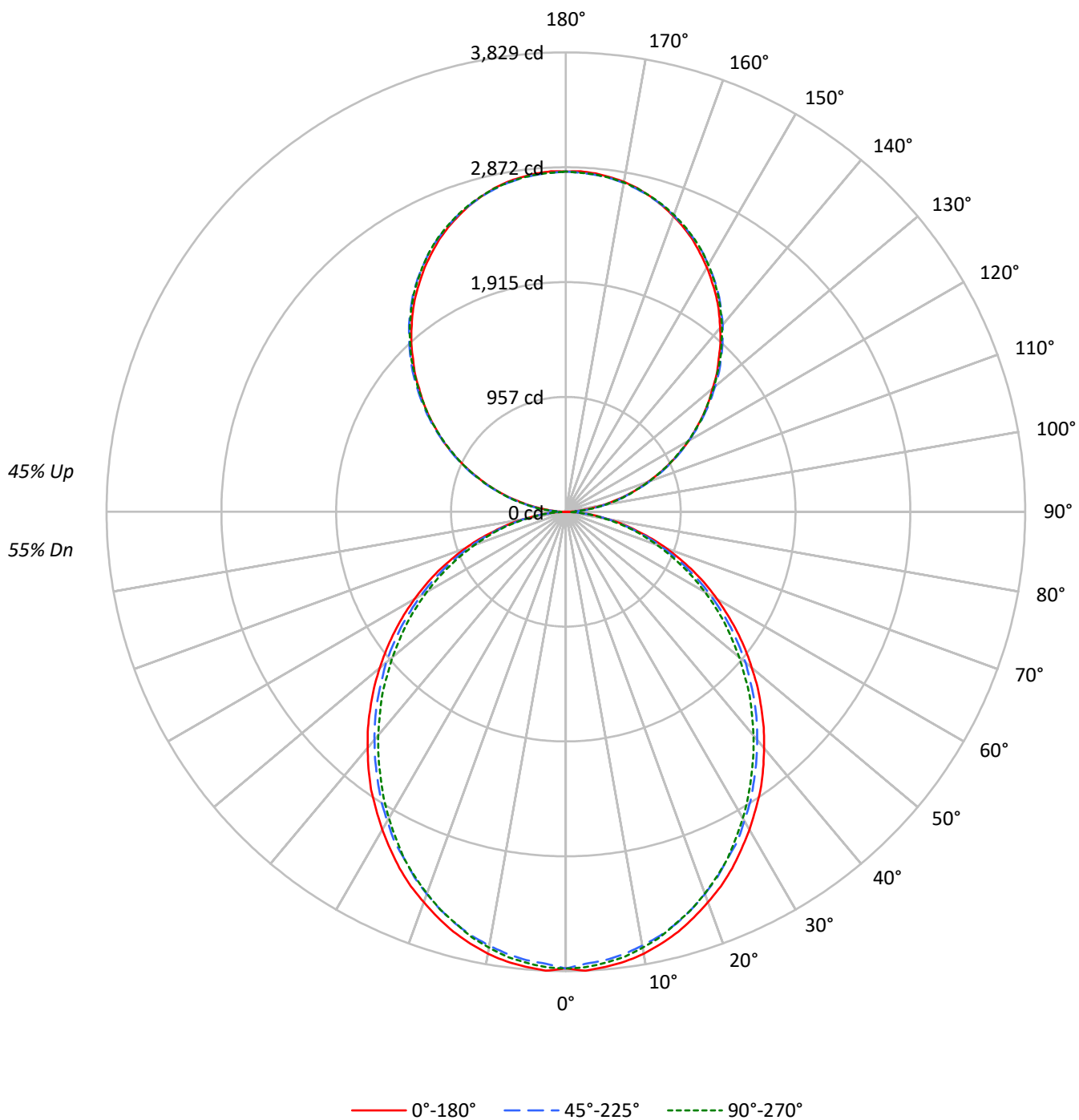
Lumens per Lamp: N/A  
Luminaire Lumens: 17622.7 lumens  
Efficiency: N/A  
Efficacy: 92.1 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.54' x L: 4.09' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 191.4  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9954  
Total Harmonic Distortion (THDi): 0.076  
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



TEST NUMBER: P916484

CATALOG NUMBER: DFN2DIP-HX4F0-120D110US930-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   | 108 | 108 | 108 | 108 | 101 | 101 | 101 | 101 | 86 | 86 | 86 | 73 | 73 | 73 | 61 | 61 | 61 |
| 1   | 99  | 95  | 91  | 87  | 92  | 88  | 85  | 81  | 76 | 73 | 71 | 64 | 62 | 61 | 54 | 52 | 51 |
| 2   | 90  | 83  | 76  | 71  | 83  | 77  | 71  | 67  | 66 | 62 | 59 | 56 | 53 | 51 | 47 | 45 | 43 |
| 3   | 82  | 73  | 65  | 59  | 76  | 68  | 61  | 56  | 58 | 53 | 49 | 50 | 46 | 43 | 42 | 39 | 37 |
| 4   | 75  | 64  | 56  | 50  | 70  | 60  | 53  | 47  | 52 | 46 | 42 | 44 | 40 | 37 | 37 | 34 | 32 |
| 5   | 69  | 57  | 49  | 43  | 64  | 54  | 46  | 41  | 46 | 41 | 36 | 40 | 35 | 32 | 34 | 30 | 28 |
| 6   | 64  | 51  | 43  | 37  | 59  | 48  | 41  | 35  | 42 | 36 | 32 | 36 | 32 | 28 | 31 | 27 | 24 |
| 7   | 59  | 46  | 38  | 33  | 55  | 44  | 36  | 31  | 38 | 32 | 28 | 33 | 28 | 25 | 28 | 24 | 22 |
| 8   | 55  | 42  | 34  | 29  | 51  | 40  | 33  | 28  | 35 | 29 | 25 | 30 | 25 | 22 | 26 | 22 | 19 |
| 9   | 51  | 39  | 31  | 26  | 47  | 36  | 29  | 25  | 32 | 26 | 22 | 28 | 23 | 20 | 24 | 20 | 18 |
| 10  | 48  | 35  | 28  | 23  | 44  | 33  | 27  | 22  | 29 | 24 | 20 | 26 | 21 | 18 | 22 | 19 | 16 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2831 | 2831 | 2831 |
| 5°  | 2835 | 2791 | 2810 |
| 10° | 2813 | 2754 | 2772 |
| 15° | 2771 | 2709 | 2713 |
| 20° | 2716 | 2646 | 2652 |
| 25° | 2661 | 2571 | 2582 |
| 30° | 2591 | 2501 | 2493 |
| 35° | 2525 | 2419 | 2398 |
| 40° | 2444 | 2336 | 2308 |
| 45° | 2364 | 2253 | 2216 |
| 50° | 2275 | 2165 | 2110 |
| 55° | 2183 | 2064 | 2012 |
| 60° | 2078 | 1943 | 1900 |
| 65° | 1965 | 1819 | 1767 |
| 70° | 1820 | 1667 | 1625 |
| 75° | 1619 | 1486 | 1494 |
| 80° | 1377 | 1255 | 1243 |
| 85° | 999  | 855  | 827  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
Vertical Angle: 45°  
Luminance: 2364 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 358.3   | 2.0       |
| 10°-20°   | 1008.1  | 5.7       |
| 20°-30°   | 1481.5  | 8.4       |
| 30°-40°   | 1720.7  | 9.8       |
| 40°-50°   | 1718.6  | 9.8       |
| 50°-60°   | 1498.5  | 8.5       |
| 60°-70°   | 1107.8  | 6.3       |
| 70°-80°   | 626.7   | 3.6       |
| 80°-90°   | 173.5   | 1.0       |
| 90°-100°  | 175.5   | 1.0       |
| 100°-110° | 557.7   | 3.2       |
| 110°-120° | 954.3   | 5.4       |
| 120°-130° | 1255.1  | 7.1       |
| 130°-140° | 1408.8  | 8.0       |
| 140°-150° | 1381.5  | 7.8       |
| 150°-160° | 1158.9  | 6.6       |
| 160°-170° | 768.5   | 4.4       |
| 170°-180° | 268.6   | 1.5       |
| 0°-30°    | 2848.0  | 16.2      |
| 0°-40°    | 4568.7  | 25.9      |
| 0°-60°    | 7785.8  | 44.2      |
| 0°-90°    | 9693.8  | 55.0      |
| 90°-120°  | 1687.5  | 9.6       |
| 90°-150°  | 5732.8  | 32.5      |
| 90°-180°  | 7929.0  | 45.0      |
| 0°-180°   | 17622.7 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3807 | 3807  | 3807 | 3807  | 3807 |      |
| 5°   | 3807 | 3792  | 3752 | 3781  | 3774 | 361  |
| 15°  | 3624 | 3602  | 3554 | 3569  | 3551 | 1021 |
| 25°  | 3280 | 3251  | 3188 | 3196  | 3188 | 1509 |
| 35°  | 2830 | 2793  | 2734 | 2712  | 2694 | 1767 |
| 45°  | 2303 | 2277  | 2222 | 2182  | 2167 | 1777 |
| 55°  | 1743 | 1720  | 1677 | 1633  | 1614 | 1558 |
| 65°  | 1175 | 1153  | 1117 | 1084  | 1065 | 1162 |
| 75°  | 615  | 608   | 589  | 567   | 575  | 656  |
| 85°  | 150  | 146   | 143  | 132   | 128  | 167  |
| 90°  | 2    | 31    | 84   | 79    | 81   | 17   |
| 95°  | 125  | 149   | 153  | 153   | 149  | 139  |
| 105° | 515  | 522   | 527  | 531   | 531  | 543  |
| 115° | 958  | 971   | 967  | 965   | 958  | 947  |
| 125° | 1393 | 1414  | 1407 | 1400  | 1397 | 1245 |
| 135° | 1802 | 1828  | 1833 | 1831  | 1824 | 1393 |
| 145° | 2187 | 2204  | 2218 | 2221  | 2211 | 1367 |
| 155° | 2501 | 2508  | 2516 | 2528  | 2520 | 1151 |
| 165° | 2721 | 2718  | 2718 | 2735  | 2723 | 768  |
| 175° | 2831 | 2824  | 2819 | 2836  | 2822 | 269  |
| 180° | 2836 | 2836  | 2836 | 2836  | 2836 |      |



TEST NUMBER: P916484

CATALOG NUMBER: DFN2DIP-HX4F0-120D110US930-FLLFLL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3806.9 | 3806.9 | 3806.9 | 3806.9 | 3806.9 |
| 2.5°   | 3829.0 | 3810.7 | 3770.3 | 3806.9 | 3799.9 |
| 5°     | 3806.9 | 3792.4 | 3752.1 | 3781.2 | 3774.2 |
| 7.5°   | 3781.2 | 3759.4 | 3719.1 | 3748.6 | 3741.2 |
| 10°    | 3741.2 | 3715.6 | 3671.7 | 3700.8 | 3690.0 |
| 12.5°  | 3686.0 | 3664.3 | 3620.4 | 3638.7 | 3631.3 |
| 15°    | 3623.9 | 3602.2 | 3554.4 | 3569.1 | 3550.9 |
| 17.5°  | 3547.0 | 3525.3 | 3477.5 | 3495.8 | 3477.5 |
| 20°    | 3462.7 | 3441.0 | 3389.8 | 3400.6 | 3386.3 |
| 22.5°  | 3378.8 | 3345.8 | 3298.0 | 3298.0 | 3290.7 |
| 25°    | 3279.8 | 3250.7 | 3188.5 | 3195.6 | 3188.5 |
| 27.5°  | 3169.9 | 3144.3 | 3096.9 | 3086.0 | 3067.8 |
| 30°    | 3060.4 | 3030.9 | 2976.1 | 2965.2 | 2950.5 |
| 32.5°  | 2943.1 | 2921.4 | 2862.7 | 2840.6 | 2825.8 |
| 35°    | 2829.7 | 2793.2 | 2734.5 | 2712.4 | 2694.2 |
| 37.5°  | 2701.5 | 2668.6 | 2609.9 | 2584.3 | 2566.0 |
| 40°    | 2569.9 | 2540.4 | 2481.7 | 2449.1 | 2434.3 |
| 42.5°  | 2441.7 | 2412.2 | 2353.9 | 2317.1 | 2295.3 |
| 45°    | 2302.6 | 2277.0 | 2221.9 | 2181.9 | 2167.1 |
| 47.5°  | 2167.1 | 2141.5 | 2082.8 | 2042.5 | 2020.7 |
| 50°    | 2024.2 | 2006.0 | 1954.7 | 1903.4 | 1885.1 |
| 52.5°  | 1885.1 | 1859.5 | 1812.2 | 1771.7 | 1746.1 |
| 55°    | 1742.6 | 1720.5 | 1676.6 | 1632.7 | 1614.5 |
| 57.5°  | 1599.7 | 1581.4 | 1533.7 | 1489.8 | 1475.0 |
| 60°    | 1456.8 | 1442.4 | 1391.1 | 1350.8 | 1339.9 |
| 62.5°  | 1317.8 | 1292.1 | 1255.6 | 1219.1 | 1204.4 |
| 65°    | 1175.3 | 1153.1 | 1116.6 | 1083.5 | 1065.4 |
| 67.5°  | 1028.8 | 1010.2 | 977.5  | 951.9  | 937.2  |
| 70°    | 893.2  | 878.5  | 845.5  | 819.9  | 805.5  |
| 72.5°  | 754.2  | 739.5  | 721.2  | 695.6  | 684.7  |
| 75°    | 614.8  | 607.8  | 589.1  | 567.4  | 574.8  |
| 77.5°  | 490.5  | 475.7  | 468.4  | 457.5  | 446.6  |
| 80°    | 366.2  | 362.3  | 355.0  | 344.1  | 336.7  |
| 82.5°  | 248.9  | 248.9  | 245.5  | 230.7  | 230.7  |
| 85°    | 149.9  | 146.4  | 142.9  | 131.7  | 128.2  |
| 87.5°  | 66.0   | 58.6   | 51.3   | 40.4   | 36.5   |
| 90°    | 2.5    | 30.8   | 83.8   | 78.7   | 81.2   |
| 92.5°  | 53.0   | 71.8   | 74.4   | 77.0   | 77.0   |
| 95°    | 124.8  | 148.8  | 153.0  | 153.0  | 148.8  |
| 97.5°  | 207.8  | 230.0  | 239.5  | 239.5  | 239.5  |
| 100°   | 303.5  | 323.2  | 330.0  | 330.0  | 327.5  |
| 102.5° | 404.5  | 419.0  | 428.4  | 431.0  | 428.4  |
| 105°   | 514.8  | 521.6  | 526.8  | 531.0  | 531.0  |
| 107.5° | 624.2  | 634.5  | 634.5  | 636.2  | 624.2  |
| 110°   | 730.3  | 744.0  | 744.0  | 744.0  | 737.1  |



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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 844.8  | 859.3  | 856.8  | 849.9  | 844.8  |
| 115°   | 957.7  | 971.3  | 967.1  | 964.6  | 957.7  |
| 117.5° | 1069.8 | 1088.5 | 1076.5 | 1069.8 | 1062.9 |
| 120°   | 1182.6 | 1201.4 | 1182.6 | 1182.6 | 1174.9 |
| 122.5° | 1285.2 | 1309.1 | 1297.1 | 1290.3 | 1285.2 |
| 125°   | 1392.9 | 1414.3 | 1407.4 | 1399.8 | 1397.2 |
| 127.5° | 1498.1 | 1524.6 | 1515.2 | 1505.0 | 1498.1 |
| 130°   | 1596.4 | 1627.3 | 1622.9 | 1617.8 | 1608.4 |
| 132.5° | 1706.7 | 1730.7 | 1732.4 | 1720.4 | 1713.6 |
| 135°   | 1801.6 | 1828.1 | 1833.3 | 1830.8 | 1823.9 |
| 137.5° | 1907.7 | 1929.1 | 1933.3 | 1931.6 | 1921.4 |
| 140°   | 2000.9 | 2022.3 | 2034.3 | 2034.3 | 2024.9 |
| 142.5° | 2096.7 | 2118.1 | 2124.9 | 2127.4 | 2118.1 |
| 145°   | 2187.3 | 2204.4 | 2218.1 | 2220.6 | 2211.3 |
| 147.5° | 2268.6 | 2289.9 | 2300.2 | 2304.4 | 2295.1 |
| 150°   | 2352.4 | 2366.9 | 2376.3 | 2384.0 | 2376.3 |
| 152.5° | 2426.7 | 2441.2 | 2453.2 | 2462.7 | 2453.2 |
| 155°   | 2501.2 | 2507.9 | 2515.7 | 2527.7 | 2519.9 |
| 157.5° | 2565.3 | 2570.4 | 2574.6 | 2591.8 | 2579.8 |
| 160°   | 2622.6 | 2627.7 | 2630.2 | 2644.8 | 2634.6 |
| 162.5° | 2675.6 | 2675.6 | 2678.2 | 2694.4 | 2682.4 |
| 165°   | 2720.9 | 2718.3 | 2718.3 | 2735.4 | 2723.4 |
| 167.5° | 2761.9 | 2754.2 | 2754.2 | 2771.4 | 2759.4 |
| 170°   | 2792.7 | 2785.9 | 2783.3 | 2800.4 | 2785.9 |
| 172.5° | 2814.1 | 2807.2 | 2804.7 | 2821.8 | 2807.2 |
| 175°   | 2831.2 | 2824.4 | 2819.2 | 2836.3 | 2821.8 |
| 177.5° | 2840.6 | 2833.7 | 2828.6 | 2843.2 | 2828.6 |
| 180°   | 2836.3 | 2836.3 | 2836.3 | 2836.3 | 2836.3 |

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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 | 11.34            | 12.25 | 12.25 | 13.18 | 14.37 | 10.91          | 11.81 | 11.82 | 12.75 | 13.94 |
|                 | 3H   | 13.00            | 13.82 | 13.93 | 14.76 | 15.98 | 12.53          | 13.34 | 13.45 | 14.28 | 15.51 |
|                 | 4H   | 13.59            | 14.36 | 14.53 | 15.31 | 16.54 | 13.12          | 13.89 | 14.06 | 14.84 | 16.07 |
|                 | 6H   | 14.00            | 14.71 | 14.95 | 15.66 | 16.90 | 13.52          | 14.23 | 14.47 | 15.18 | 16.43 |
|                 | 8H   | 14.10            | 14.78 | 15.06 | 15.75 | 16.99 | 13.63          | 14.30 | 14.58 | 15.27 | 16.51 |
|                 | 12H  | 14.15            | 14.80 | 15.12 | 15.76 | 17.03 | 13.67          | 14.31 | 14.63 | 15.28 | 16.54 |
| 4H              | 2H   | 11.80            | 12.58 | 12.75 | 13.52 | 14.75 | 11.46          | 12.23 | 12.41 | 13.18 | 14.41 |
|                 | 3H   | 13.68            | 14.32 | 14.63 | 15.30 | 16.54 | 13.28          | 13.93 | 14.24 | 14.90 | 16.15 |
|                 | 4H   | 14.39            | 14.98 | 15.36 | 15.95 | 17.22 | 13.99          | 14.58 | 14.95 | 15.55 | 16.82 |
|                 | 6H   | 14.91            | 15.42 | 15.89 | 16.41 | 17.68 | 14.50          | 15.01 | 15.48 | 16.00 | 17.27 |
|                 | 8H   | 15.06            | 15.54 | 16.04 | 16.52 | 17.81 | 14.65          | 15.12 | 15.63 | 16.11 | 17.40 |
|                 | 12H  | 15.14            | 15.57 | 16.14 | 16.57 | 17.86 | 14.72          | 15.14 | 15.72 | 16.15 | 17.44 |
| 8H              | 4H   | 14.59            | 15.07 | 15.57 | 16.06 | 17.34 | 14.23          | 14.71 | 15.21 | 15.69 | 16.98 |
|                 | 6H   | 15.23            | 15.62 | 16.23 | 16.65 | 17.93 | 14.87          | 15.26 | 15.87 | 16.29 | 17.57 |
|                 | 8H   | 15.45            | 15.80 | 16.46 | 16.81 | 18.11 | 15.08          | 15.43 | 16.09 | 16.44 | 17.74 |
|                 | 12H  | 15.59            | 15.89 | 16.60 | 16.90 | 18.25 | 15.20          | 15.51 | 16.22 | 16.52 | 17.86 |
| 12H             | 4H   | 14.58            | 15.01 | 15.58 | 16.01 | 17.30 | 14.23          | 14.66 | 15.23 | 15.66 | 16.95 |
|                 | 6H   | 15.26            | 15.61 | 16.27 | 16.62 | 17.92 | 14.91          | 15.25 | 15.92 | 16.27 | 17.57 |
|                 | 8H   | 15.50            | 15.81 | 16.52 | 16.82 | 18.17 | 15.15          | 15.45 | 16.16 | 16.46 | 17.81 |