

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: P905566

Luminaire Tested: DFN2DIP-HX4F0-120D080US835-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P905566  
REPORT IS A COMBINATION OF REPORTS P899387 AND P896188  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX4F0-120D080US835-FLLFLL  
Description: 4 foot, Hexagon Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

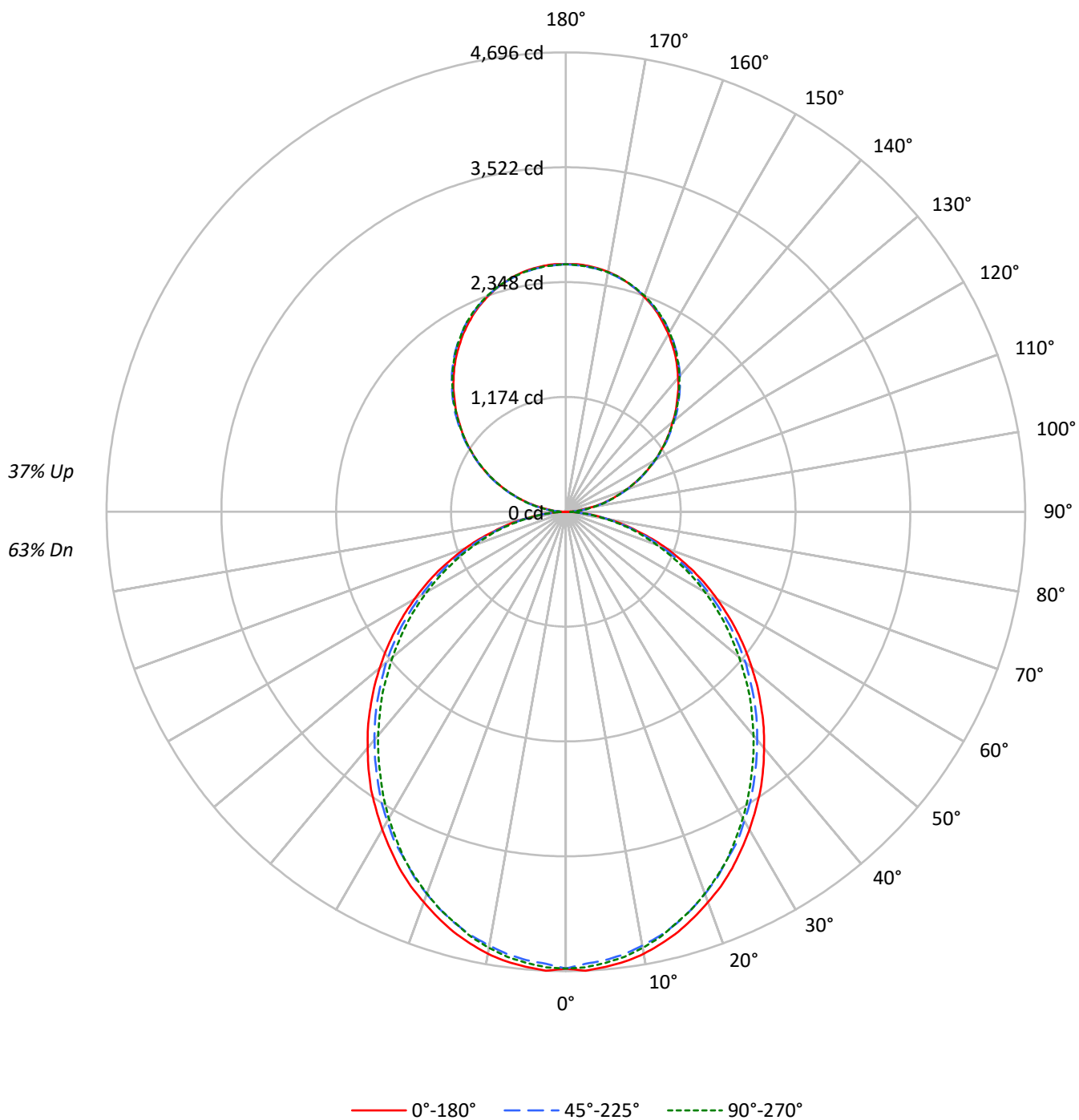
Lumens per Lamp: N/A  
Luminaire Lumens: 18960.0 lumens  
Efficiency: N/A  
Efficacy: 110.6 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.54' x L: 4.09' x H: 0.1')  
CIE Type: Semi-Direct

Input Watts (W): 171.5  
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: P905566

CATALOG NUMBER: DFN2DIP-HX4F0-120D080US835-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 | 103 | 103 | 103 | 103 | 90 | 90 | 90 | 79 | 79 | 79 | 68 | 68 | 68 |
| 1   | 101 | 96  | 92  | 89  | 94  | 90  | 87  | 84  | 79 | 77 | 74 | 69 | 67 | 66 | 60 | 59 | 57 |
| 2   | 92  | 84  | 78  | 72  | 86  | 79  | 73  | 69  | 70 | 65 | 62 | 61 | 58 | 55 | 53 | 50 | 48 |
| 3   | 84  | 74  | 66  | 60  | 78  | 70  | 63  | 58  | 61 | 56 | 52 | 54 | 50 | 46 | 47 | 44 | 41 |
| 4   | 77  | 66  | 57  | 51  | 71  | 62  | 54  | 49  | 55 | 49 | 44 | 48 | 43 | 40 | 42 | 38 | 35 |
| 5   | 70  | 58  | 50  | 44  | 66  | 55  | 48  | 42  | 49 | 43 | 38 | 43 | 38 | 35 | 38 | 34 | 31 |
| 6   | 65  | 53  | 44  | 38  | 61  | 50  | 42  | 37  | 44 | 38 | 33 | 39 | 34 | 30 | 34 | 30 | 27 |
| 7   | 60  | 48  | 39  | 34  | 56  | 45  | 38  | 32  | 40 | 34 | 30 | 36 | 31 | 27 | 31 | 27 | 24 |
| 8   | 56  | 43  | 35  | 30  | 52  | 41  | 34  | 29  | 37 | 31 | 26 | 33 | 28 | 24 | 29 | 25 | 22 |
| 9   | 52  | 40  | 32  | 27  | 49  | 38  | 30  | 26  | 34 | 28 | 24 | 30 | 25 | 22 | 27 | 23 | 20 |
| 10  | 49  | 36  | 29  | 24  | 46  | 35  | 28  | 23  | 31 | 25 | 21 | 28 | 23 | 20 | 25 | 21 | 18 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3472 | 3472 | 3472 |
| 5°  | 3478 | 3424 | 3447 |
| 10° | 3450 | 3378 | 3400 |
| 15° | 3399 | 3323 | 3328 |
| 20° | 3331 | 3246 | 3253 |
| 25° | 3263 | 3154 | 3167 |
| 30° | 3178 | 3068 | 3057 |
| 35° | 3097 | 2967 | 2941 |
| 40° | 2998 | 2865 | 2831 |
| 45° | 2899 | 2763 | 2718 |
| 50° | 2791 | 2655 | 2588 |
| 55° | 2677 | 2531 | 2468 |
| 60° | 2549 | 2384 | 2330 |
| 65° | 2410 | 2231 | 2168 |
| 70° | 2232 | 2045 | 1993 |
| 75° | 1985 | 1822 | 1832 |
| 80° | 1689 | 1539 | 1524 |
| 85° | 1226 | 1049 | 1014 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2899 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 439.5   | 2.3       |
| 10°-20°   | 1236.5  | 6.5       |
| 20°-30°   | 1817.2  | 9.6       |
| 30°-40°   | 2110.5  | 11.1      |
| 40°-50°   | 2107.9  | 11.1      |
| 50°-60°   | 1838.0  | 9.7       |
| 60°-70°   | 1358.7  | 7.2       |
| 70°-80°   | 768.7   | 4.1       |
| 80°-90°   | 210.1   | 1.1       |
| 90°-100°  | 156.6   | 0.8       |
| 100°-110° | 497.5   | 2.6       |
| 110°-120° | 851.3   | 4.5       |
| 120°-130° | 1119.6  | 5.9       |
| 130°-140° | 1256.7  | 6.6       |
| 140°-150° | 1232.3  | 6.5       |
| 150°-160° | 1033.7  | 5.5       |
| 160°-170° | 685.6   | 3.6       |
| 170°-180° | 239.6   | 1.3       |
| 0°-30°    | 3493.1  | 18.4      |
| 0°-40°    | 5603.7  | 29.6      |
| 0°-60°    | 9549.6  | 50.4      |
| 0°-90°    | 11887.2 | 62.7      |
| 90°-120°  | 1505.3  | 7.9       |
| 90°-150°  | 5113.9  | 27.0      |
| 90°-180°  | 7073.0  | 37.3      |
| 0°-180°   | 18960.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 4669 | 4669  | 4669 | 4669  | 4669 |      |
| 5°   | 4669 | 4652  | 4602 | 4638  | 4629 | 443  |
| 15°  | 4445 | 4418  | 4360 | 4378  | 4355 | 1252 |
| 25°  | 4023 | 3987  | 3911 | 3920  | 3911 | 1851 |
| 35°  | 3471 | 3426  | 3354 | 3327  | 3304 | 2167 |
| 45°  | 2824 | 2793  | 2725 | 2676  | 2658 | 2180 |
| 55°  | 2137 | 2110  | 2056 | 2003  | 1980 | 1911 |
| 65°  | 1442 | 1414  | 1370 | 1329  | 1307 | 1425 |
| 75°  | 754  | 746   | 723  | 696   | 705  | 805  |
| 85°  | 184  | 180   | 175  | 162   | 157  | 205  |
| 90°  | 2    | 28    | 75   | 70    | 72   | 18   |
| 95°  | 111  | 133   | 136  | 136   | 133  | 124  |
| 105° | 459  | 465   | 470  | 474   | 474  | 485  |
| 115° | 854  | 866   | 863  | 860   | 854  | 845  |
| 125° | 1242 | 1262  | 1256 | 1249  | 1246 | 1110 |
| 135° | 1607 | 1631  | 1635 | 1633  | 1627 | 1242 |
| 145° | 1951 | 1966  | 1979 | 1981  | 1972 | 1219 |
| 155° | 2231 | 2237  | 2244 | 2255  | 2248 | 1027 |
| 165° | 2427 | 2425  | 2425 | 2440  | 2429 | 685  |
| 175° | 2526 | 2519  | 2515 | 2530  | 2517 | 240  |
| 180° | 2530 | 2530  | 2530 | 2530  | 2530 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 4669.3 | 4669.3 | 4669.3 | 4669.3 | 4669.3 |
| 2.5°   | 4696.4 | 4674.0 | 4624.5 | 4669.3 | 4660.7 |
| 5°     | 4669.3 | 4651.6 | 4602.1 | 4637.8 | 4629.2 |
| 7.5°   | 4637.8 | 4611.1 | 4561.6 | 4597.8 | 4588.8 |
| 10°    | 4588.8 | 4557.3 | 4503.5 | 4539.2 | 4525.9 |
| 12.5°  | 4521.1 | 4494.4 | 4440.6 | 4463.0 | 4453.9 |
| 15°    | 4444.9 | 4418.2 | 4359.6 | 4377.7 | 4355.3 |
| 17.5°  | 4350.6 | 4323.9 | 4265.3 | 4287.7 | 4265.3 |
| 20°    | 4247.2 | 4220.5 | 4157.7 | 4171.0 | 4153.4 |
| 22.5°  | 4144.3 | 4103.8 | 4045.2 | 4045.2 | 4036.2 |
| 25°    | 4022.8 | 3987.1 | 3910.9 | 3919.5 | 3910.9 |
| 27.5°  | 3888.0 | 3856.6 | 3798.5 | 3785.1 | 3762.8 |
| 30°    | 3753.7 | 3717.5 | 3650.3 | 3637.0 | 3618.9 |
| 32.5°  | 3609.8 | 3583.2 | 3511.2 | 3484.1 | 3466.0 |
| 35°    | 3470.7 | 3426.0 | 3354.0 | 3326.9 | 3304.5 |
| 37.5°  | 3313.5 | 3273.1 | 3201.1 | 3169.7 | 3147.3 |
| 40°    | 3152.1 | 3115.9 | 3043.9 | 3003.9 | 2985.8 |
| 42.5°  | 2994.9 | 2958.7 | 2887.2 | 2842.0 | 2815.3 |
| 45°    | 2824.3 | 2792.9 | 2725.2 | 2676.2 | 2658.1 |
| 47.5°  | 2658.1 | 2626.6 | 2554.7 | 2505.2 | 2478.5 |
| 50°    | 2482.8 | 2460.4 | 2397.5 | 2334.6 | 2312.2 |
| 52.5°  | 2312.2 | 2280.8 | 2222.7 | 2173.1 | 2141.7 |
| 55°    | 2137.4 | 2110.3 | 2056.4 | 2002.6 | 1980.2 |
| 57.5°  | 1962.1 | 1939.7 | 1881.1 | 1827.3 | 1809.2 |
| 60°    | 1786.8 | 1769.2 | 1706.3 | 1656.8 | 1643.4 |
| 62.5°  | 1616.3 | 1584.8 | 1540.1 | 1495.3 | 1477.2 |
| 65°    | 1441.5 | 1414.3 | 1369.5 | 1329.0 | 1306.7 |
| 67.5°  | 1261.9 | 1239.0 | 1199.0 | 1167.6 | 1149.5 |
| 70°    | 1095.6 | 1077.5 | 1037.0 | 1005.6 | 988.0  |
| 72.5°  | 925.1  | 907.0  | 884.6  | 853.2  | 839.8  |
| 75°    | 754.1  | 745.5  | 722.6  | 696.0  | 705.0  |
| 77.5°  | 601.6  | 583.5  | 574.5  | 561.1  | 547.8  |
| 80°    | 449.2  | 444.4  | 435.4  | 422.1  | 413.0  |
| 82.5°  | 305.3  | 305.3  | 301.1  | 283.0  | 283.0  |
| 85°    | 183.9  | 179.6  | 175.3  | 161.5  | 157.2  |
| 87.5°  | 81.0   | 71.9   | 62.9   | 49.5   | 44.8   |
| 90°    | 2.3    | 27.5   | 74.8   | 70.2   | 72.5   |
| 92.5°  | 47.3   | 64.1   | 66.4   | 68.6   | 68.6   |
| 95°    | 111.4  | 132.7  | 136.5  | 136.5  | 132.7  |
| 97.5°  | 185.4  | 205.2  | 213.6  | 213.6  | 213.6  |
| 100°   | 270.8  | 288.3  | 294.4  | 294.4  | 292.1  |
| 102.5° | 360.8  | 373.8  | 382.1  | 384.4  | 382.1  |
| 105°   | 459.2  | 465.3  | 469.9  | 473.7  | 473.7  |
| 107.5° | 556.8  | 566.0  | 566.0  | 567.5  | 556.8  |
| 110°   | 651.4  | 663.6  | 663.6  | 663.6  | 657.5  |



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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 753.6  | 766.6  | 764.3  | 758.2  | 753.6  |
| 115°   | 854.3  | 866.5  | 862.7  | 860.4  | 854.3  |
| 117.5° | 954.2  | 971.0  | 960.3  | 954.2  | 948.1  |
| 120°   | 1054.9 | 1071.7 | 1054.9 | 1054.9 | 1048.0 |
| 122.5° | 1146.4 | 1167.8 | 1157.1 | 1151.0 | 1146.4 |
| 125°   | 1242.5 | 1261.6 | 1255.5 | 1248.6 | 1246.4 |
| 127.5° | 1336.4 | 1360.0 | 1351.6 | 1342.5 | 1336.4 |
| 130°   | 1424.1 | 1451.5 | 1447.7 | 1443.2 | 1434.8 |
| 132.5° | 1522.5 | 1543.8 | 1545.4 | 1534.7 | 1528.6 |
| 135°   | 1607.1 | 1630.8 | 1635.4 | 1633.1 | 1627.0 |
| 137.5° | 1701.7 | 1720.8 | 1724.6 | 1723.1 | 1713.9 |
| 140°   | 1784.9 | 1803.9 | 1814.6 | 1814.6 | 1806.2 |
| 142.5° | 1870.3 | 1889.4 | 1895.5 | 1897.8 | 1889.4 |
| 145°   | 1951.2 | 1966.4 | 1978.6 | 1980.9 | 1972.5 |
| 147.5° | 2023.6 | 2042.7 | 2051.8 | 2055.7 | 2047.3 |
| 150°   | 2098.4 | 2111.3 | 2119.7 | 2126.6 | 2119.7 |
| 152.5° | 2164.7 | 2177.7 | 2188.4 | 2196.8 | 2188.4 |
| 155°   | 2231.1 | 2237.2 | 2244.1 | 2254.7 | 2247.9 |
| 157.5° | 2288.3 | 2292.9 | 2296.7 | 2311.9 | 2301.3 |
| 160°   | 2339.4 | 2344.0 | 2346.3 | 2359.2 | 2350.1 |
| 162.5° | 2386.7 | 2386.7 | 2389.0 | 2403.5 | 2392.8 |
| 165°   | 2427.1 | 2424.8 | 2424.8 | 2440.1 | 2429.4 |
| 167.5° | 2463.7 | 2456.9 | 2456.9 | 2472.1 | 2461.4 |
| 170°   | 2491.2 | 2485.1 | 2482.8 | 2498.1 | 2485.1 |
| 172.5° | 2510.3 | 2504.2 | 2501.9 | 2517.1 | 2504.2 |
| 175°   | 2525.5 | 2519.4 | 2514.8 | 2530.1 | 2517.1 |
| 177.5° | 2533.9 | 2527.8 | 2523.2 | 2536.2 | 2523.2 |
| 180°   | 2530.1 | 2530.1 | 2530.1 | 2530.1 | 2530.1 |

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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 | 12.69            | 13.68 | 13.53 | 14.54 | 15.62 | 12.26          | 13.25 | 13.10 | 14.11 | 15.19 |
|                 | 3H   | 14.36            | 15.25 | 15.21 | 16.12 | 17.23 | 13.89          | 14.78 | 14.74 | 15.65 | 16.75 |
|                 | 4H   | 14.96            | 15.79 | 15.83 | 16.67 | 17.79 | 14.48          | 15.32 | 15.35 | 16.20 | 17.31 |
|                 | 6H   | 15.36            | 16.14 | 16.24 | 17.02 | 18.15 | 14.89          | 15.66 | 15.77 | 16.55 | 17.67 |
|                 | 8H   | 15.47            | 16.21 | 16.36 | 17.11 | 18.24 | 15.00          | 15.73 | 15.89 | 16.64 | 17.77 |
|                 | 12H  | 15.53            | 16.23 | 16.42 | 17.12 | 18.28 | 15.04          | 15.75 | 15.94 | 16.64 | 17.80 |
| 4H              | 2H   | 13.17            | 14.01 | 14.04 | 14.89 | 16.00 | 12.82          | 13.66 | 13.70 | 14.54 | 15.66 |
|                 | 3H   | 15.05            | 15.75 | 15.93 | 16.66 | 17.79 | 14.65          | 15.35 | 15.54 | 16.27 | 17.40 |
|                 | 4H   | 15.77            | 16.41 | 16.66 | 17.31 | 18.47 | 15.36          | 16.00 | 16.26 | 16.91 | 18.06 |
|                 | 6H   | 16.29            | 16.84 | 17.20 | 17.77 | 18.93 | 15.88          | 16.43 | 16.79 | 17.36 | 18.52 |
|                 | 8H   | 16.44            | 16.96 | 17.36 | 17.88 | 19.06 | 16.03          | 16.55 | 16.95 | 17.47 | 18.64 |
|                 | 12H  | 16.52            | 16.99 | 17.46 | 17.93 | 19.11 | 16.10          | 16.57 | 17.04 | 17.51 | 18.69 |
| 8H              | 4H   | 15.98            | 16.49 | 16.89 | 17.42 | 18.59 | 15.62          | 16.13 | 16.53 | 17.06 | 18.23 |
|                 | 6H   | 16.61            | 17.04 | 17.55 | 18.01 | 19.18 | 16.25          | 16.68 | 17.19 | 17.64 | 18.81 |
|                 | 8H   | 16.84            | 17.21 | 17.79 | 18.17 | 19.36 | 16.47          | 16.84 | 17.42 | 17.80 | 18.99 |
|                 | 12H  | 16.97            | 17.31 | 17.93 | 18.26 | 19.50 | 16.59          | 16.92 | 17.54 | 17.87 | 19.11 |
| 12H             | 4H   | 15.97            | 16.43 | 16.90 | 17.38 | 18.55 | 15.62          | 16.08 | 16.55 | 17.02 | 18.20 |
|                 | 6H   | 16.64            | 17.02 | 17.60 | 17.98 | 19.17 | 16.29          | 16.67 | 17.24 | 17.63 | 18.82 |
|                 | 8H   | 16.89            | 17.23 | 17.85 | 18.18 | 19.42 | 16.54          | 16.87 | 17.49 | 17.82 | 19.06 |