

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: P913742

Luminaire Tested: DFN2DIP-HX4F0-120D040US927-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P913742  
REPORT IS A COMBINATION OF REPORTS P899315 AND P896188  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX4F0-120D040US927-FLLFLL  
Description: 4 foot, Hexagon Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

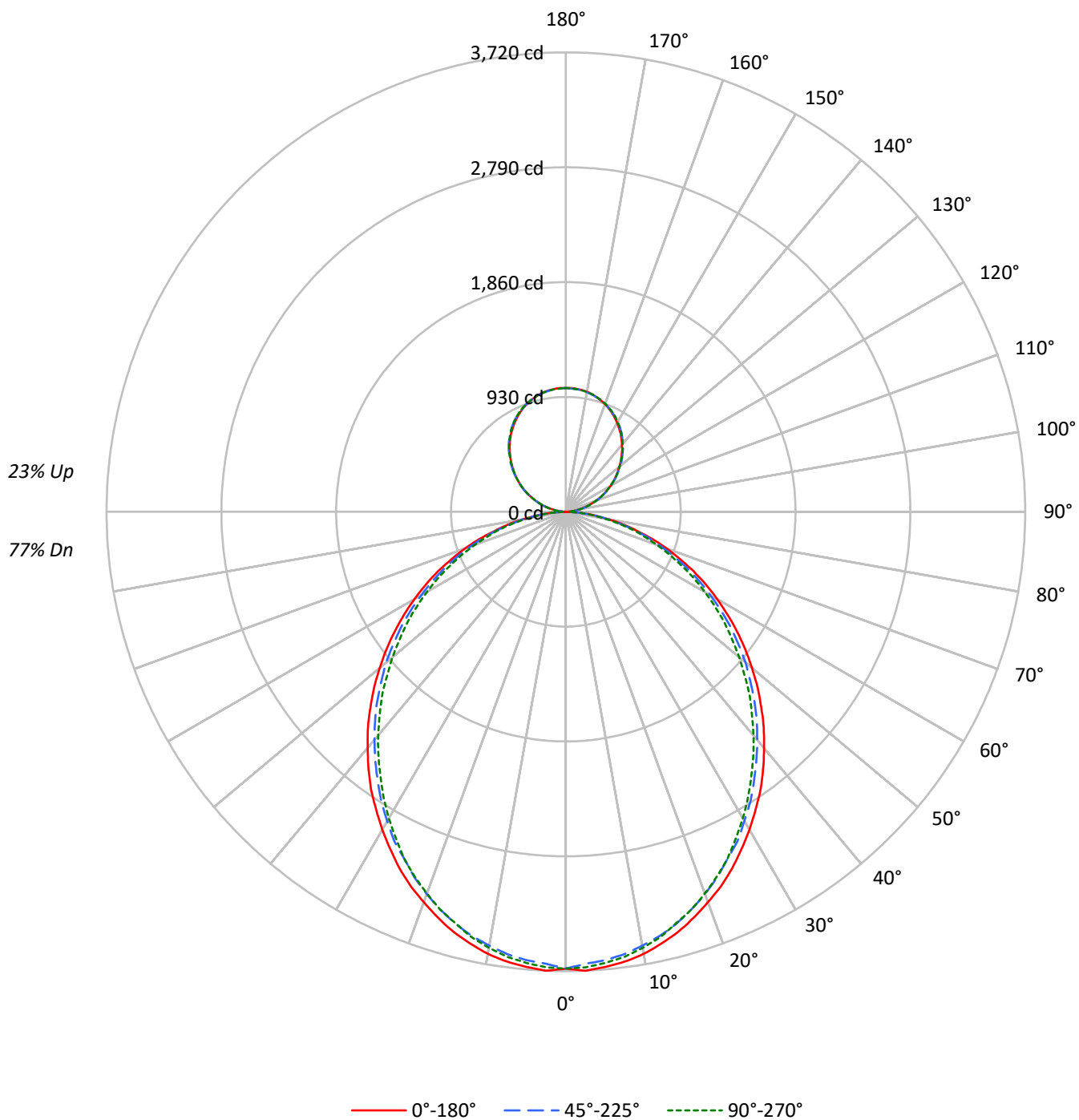
Lumens per Lamp: N/A  
Luminaire Lumens: 12215.4 lumens  
Efficiency: N/A  
Efficacy: 81.5 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.54' x L: 4.09' x H: 0.1')  
CIE Type: Semi-Direct

Input Watts (W): 149.9  
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

TEST NUMBER: P913742

CATALOG NUMBER: DFN2DIP-HX4F0-120D040US927-FLLFLL

### Luminous Intensity Polar Plot



TEST NUMBER: P913742

CATALOG NUMBER: DFN2DIP-HX4F0-120D040US927-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   | 114 | 114 | 114 | 114 | 108 | 108 | 108 | 108 | 98 | 98 | 98 | 89 | 89 | 89 | 81 | 81 | 81 |
| 1   | 104 | 99  | 95  | 92  | 99  | 95  | 91  | 88  | 86 | 84 | 81 | 79 | 77 | 75 | 72 | 70 | 68 |
| 2   | 95  | 87  | 80  | 75  | 90  | 83  | 77  | 72  | 76 | 71 | 67 | 69 | 66 | 62 | 63 | 60 | 58 |
| 3   | 86  | 76  | 69  | 63  | 82  | 73  | 66  | 61  | 67 | 61 | 57 | 61 | 57 | 53 | 56 | 52 | 49 |
| 4   | 79  | 68  | 59  | 53  | 75  | 65  | 57  | 52  | 60 | 53 | 48 | 55 | 50 | 45 | 50 | 46 | 42 |
| 5   | 73  | 61  | 52  | 46  | 69  | 58  | 50  | 44  | 53 | 47 | 42 | 49 | 44 | 39 | 45 | 41 | 37 |
| 6   | 67  | 55  | 46  | 40  | 64  | 52  | 45  | 39  | 48 | 42 | 37 | 45 | 39 | 35 | 41 | 36 | 33 |
| 7   | 62  | 49  | 41  | 35  | 59  | 48  | 40  | 34  | 44 | 37 | 33 | 41 | 35 | 31 | 37 | 33 | 29 |
| 8   | 58  | 45  | 37  | 31  | 55  | 43  | 36  | 31  | 40 | 34 | 29 | 37 | 32 | 28 | 34 | 30 | 26 |
| 9   | 54  | 41  | 33  | 28  | 52  | 40  | 32  | 27  | 37 | 31 | 26 | 34 | 29 | 25 | 32 | 27 | 24 |
| 10  | 51  | 38  | 30  | 25  | 48  | 37  | 30  | 25  | 34 | 28 | 24 | 32 | 26 | 23 | 30 | 25 | 22 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2750 | 2750 | 2750 |
| 5°  | 2755 | 2712 | 2730 |
| 10° | 2733 | 2676 | 2694 |
| 15° | 2693 | 2632 | 2636 |
| 20° | 2639 | 2571 | 2577 |
| 25° | 2585 | 2498 | 2509 |
| 30° | 2518 | 2431 | 2422 |
| 35° | 2454 | 2350 | 2330 |
| 40° | 2375 | 2270 | 2243 |
| 45° | 2297 | 2189 | 2153 |
| 50° | 2211 | 2104 | 2050 |
| 55° | 2121 | 2005 | 1955 |
| 60° | 2019 | 1888 | 1846 |
| 65° | 1909 | 1768 | 1717 |
| 70° | 1768 | 1620 | 1579 |
| 75° | 1573 | 1444 | 1452 |
| 80° | 1338 | 1219 | 1208 |
| 85° | 971  | 831  | 803  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
Vertical Angle: 45°  
Luminance: 2297 cd/sqm

TEST NUMBER: P913742

CATALOG NUMBER: DFN2DIP-HX4F0-120D040US927-FLLFLL

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 348.1   | 2.9       |
| 10°-20°   | 979.5   | 8.0       |
| 20°-30°   | 1439.5  | 11.8      |
| 30°-40°   | 1671.9  | 13.7      |
| 40°-50°   | 1669.9  | 13.7      |
| 50°-60°   | 1456.0  | 11.9      |
| 60°-70°   | 1076.3  | 8.8       |
| 70°-80°   | 609.0   | 5.0       |
| 80°-90°   | 163.6   | 1.3       |
| 90°-100°  | 62.0    | 0.5       |
| 100°-110° | 197.0   | 1.6       |
| 110°-120° | 337.2   | 2.8       |
| 120°-130° | 443.5   | 3.6       |
| 130°-140° | 497.8   | 4.1       |
| 140°-150° | 488.1   | 4.0       |
| 150°-160° | 409.5   | 3.4       |
| 160°-170° | 271.5   | 2.2       |
| 170°-180° | 94.9    | 0.8       |
| 0°-30°    | 2767.2  | 22.7      |
| 0°-40°    | 4439.1  | 36.3      |
| 0°-60°    | 7565.0  | 61.9      |
| 0°-90°    | 9414.0  | 77.1      |
| 90°-120°  | 596.2   | 4.9       |
| 90°-150°  | 2025.6  | 16.6      |
| 90°-180°  | 2801.0  | 22.9      |
| 0°-180°   | 12215.4 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3699 | 3699  | 3699 | 3699  | 3699 |      |
| 5°   | 3699 | 3685  | 3646 | 3674  | 3667 | 351  |
| 15°  | 3521 | 3500  | 3454 | 3468  | 3450 | 992  |
| 25°  | 3187 | 3158  | 3098 | 3105  | 3098 | 1466 |
| 35°  | 2749 | 2714  | 2657 | 2636  | 2618 | 1717 |
| 45°  | 2237 | 2212  | 2159 | 2120  | 2106 | 1727 |
| 55°  | 1693 | 1672  | 1629 | 1586  | 1569 | 1514 |
| 65°  | 1142 | 1120  | 1085 | 1053  | 1035 | 1129 |
| 75°  | 597  | 591   | 572  | 551   | 558  | 638  |
| 85°  | 146  | 142   | 139  | 128   | 124  | 162  |
| 90°  | 1    | 11    | 30   | 28    | 29   | 12   |
| 95°  | 44   | 53    | 54   | 54    | 53   | 49   |
| 105° | 182  | 184   | 186  | 188   | 188  | 192  |
| 115° | 338  | 343   | 342  | 341   | 338  | 335  |
| 125° | 492  | 500   | 497  | 495   | 494  | 440  |
| 135° | 637  | 646   | 648  | 647   | 644  | 492  |
| 145° | 773  | 779   | 784  | 785   | 781  | 483  |
| 155° | 884  | 886   | 889  | 893   | 890  | 407  |
| 165° | 961  | 960   | 960  | 966   | 962  | 271  |
| 175° | 1000 | 998   | 996  | 1002  | 997  | 95   |
| 180° | 1002 | 1002  | 1002 | 1002  | 1002 |      |

TEST NUMBER: P913742

CATALOG NUMBER: DFN2DIP-HX4F0-120D040US927-FLLFLL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3698.9 | 3698.9 | 3698.9 | 3698.9 | 3698.9 |
| 2.5°   | 3720.4 | 3702.7 | 3663.4 | 3698.9 | 3692.1 |
| 5°     | 3698.9 | 3684.9 | 3645.7 | 3674.0 | 3667.2 |
| 7.5°   | 3674.0 | 3652.8 | 3613.6 | 3642.3 | 3635.2 |
| 10°    | 3635.2 | 3610.2 | 3567.6 | 3595.9 | 3585.3 |
| 12.5°  | 3581.5 | 3560.4 | 3517.8 | 3535.5 | 3528.3 |
| 15°    | 3521.2 | 3500.0 | 3453.6 | 3467.9 | 3450.2 |
| 17.5°  | 3446.5 | 3425.3 | 3378.9 | 3396.6 | 3378.9 |
| 20°    | 3364.6 | 3343.4 | 3293.7 | 3304.2 | 3290.2 |
| 22.5°  | 3283.0 | 3251.0 | 3204.5 | 3204.5 | 3197.4 |
| 25°    | 3186.8 | 3158.5 | 3098.1 | 3105.0 | 3098.1 |
| 27.5°  | 3080.0 | 3055.1 | 3009.1 | 2998.5 | 2980.8 |
| 30°    | 2973.6 | 2944.9 | 2891.7 | 2881.2 | 2866.8 |
| 32.5°  | 2859.6 | 2838.5 | 2781.5 | 2760.0 | 2745.7 |
| 35°    | 2749.4 | 2714.0 | 2657.0 | 2635.5 | 2617.8 |
| 37.5°  | 2624.9 | 2592.9 | 2535.9 | 2511.0 | 2493.2 |
| 40°    | 2497.0 | 2468.4 | 2411.3 | 2379.6 | 2365.3 |
| 42.5°  | 2372.5 | 2343.8 | 2287.2 | 2251.4 | 2230.2 |
| 45°    | 2237.4 | 2212.5 | 2158.9 | 2120.0 | 2105.7 |
| 47.5°  | 2105.7 | 2080.7 | 2023.8 | 1984.6 | 1963.4 |
| 50°    | 1966.8 | 1949.1 | 1899.3 | 1849.4 | 1831.7 |
| 52.5°  | 1831.7 | 1806.8 | 1760.8 | 1721.5 | 1696.6 |
| 55°    | 1693.2 | 1671.7 | 1629.0 | 1586.4 | 1568.7 |
| 57.5°  | 1554.3 | 1536.6 | 1490.2 | 1447.6 | 1433.2 |
| 60°    | 1415.5 | 1401.5 | 1351.7 | 1312.5 | 1301.9 |
| 62.5°  | 1280.4 | 1255.4 | 1220.0 | 1184.5 | 1170.2 |
| 65°    | 1141.9 | 1120.4 | 1084.9 | 1052.8 | 1035.1 |
| 67.5°  | 999.7  | 981.5  | 949.8  | 925.0  | 910.6  |
| 70°    | 867.9  | 853.6  | 821.5  | 796.6  | 782.7  |
| 72.5°  | 732.8  | 718.5  | 700.8  | 675.9  | 665.3  |
| 75°    | 597.4  | 590.6  | 572.4  | 551.4  | 558.5  |
| 77.5°  | 476.6  | 462.2  | 455.1  | 444.5  | 434.0  |
| 80°    | 355.8  | 352.0  | 344.9  | 334.4  | 327.2  |
| 82.5°  | 241.9  | 241.9  | 238.5  | 224.2  | 224.2  |
| 85°    | 145.7  | 142.3  | 138.9  | 127.9  | 124.5  |
| 87.5°  | 64.2   | 57.0   | 49.8   | 39.2   | 35.5   |
| 90°    | 0.9    | 10.9   | 29.6   | 27.8   | 28.7   |
| 92.5°  | 18.7   | 25.3   | 26.3   | 27.2   | 27.2   |
| 95°    | 44.1   | 52.6   | 54.1   | 54.1   | 52.6   |
| 97.5°  | 73.4   | 81.3   | 84.6   | 84.6   | 84.6   |
| 100°   | 107.3  | 114.2  | 116.6  | 116.6  | 115.7  |
| 102.5° | 142.9  | 148.1  | 151.4  | 152.3  | 151.4  |
| 105°   | 181.9  | 184.3  | 186.1  | 187.6  | 187.6  |
| 107.5° | 220.5  | 224.2  | 224.2  | 224.7  | 220.5  |
| 110°   | 258.0  | 262.8  | 262.8  | 262.8  | 260.5  |

TEST NUMBER: P913742

CATALOG NUMBER: DFN2DIP-HX4F0-120D040US927-FLLFLL

**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 298.5  | 303.6  | 302.7  | 300.3  | 298.5  |
| 115°   | 338.3  | 343.3  | 341.7  | 340.8  | 338.3  |
| 117.5° | 377.9  | 384.6  | 380.4  | 377.9  | 375.6  |
| 120°   | 417.9  | 424.5  | 417.9  | 417.9  | 415.1  |
| 122.5° | 454.1  | 462.6  | 458.4  | 455.9  | 454.1  |
| 125°   | 492.2  | 499.7  | 497.3  | 494.6  | 493.7  |
| 127.5° | 529.3  | 538.7  | 535.4  | 531.7  | 529.3  |
| 130°   | 564.0  | 575.0  | 573.5  | 571.6  | 568.3  |
| 132.5° | 603.0  | 611.5  | 612.1  | 607.8  | 605.5  |
| 135°   | 636.6  | 645.9  | 647.8  | 646.8  | 644.4  |
| 137.5° | 674.1  | 681.6  | 683.1  | 682.5  | 678.9  |
| 140°   | 706.9  | 714.5  | 718.7  | 718.7  | 715.4  |
| 142.5° | 740.8  | 748.4  | 750.8  | 751.7  | 748.4  |
| 145°   | 772.9  | 778.9  | 783.7  | 784.7  | 781.3  |
| 147.5° | 801.5  | 809.1  | 812.7  | 814.2  | 810.9  |
| 150°   | 831.2  | 836.3  | 839.6  | 842.3  | 839.6  |
| 152.5° | 857.5  | 862.5  | 866.8  | 870.1  | 866.8  |
| 155°   | 883.7  | 886.1  | 888.8  | 893.1  | 890.3  |
| 157.5° | 906.4  | 908.2  | 909.7  | 915.8  | 911.5  |
| 160°   | 926.6  | 928.4  | 929.3  | 934.5  | 930.8  |
| 162.5° | 945.3  | 945.3  | 946.3  | 952.0  | 947.8  |
| 165°   | 961.4  | 960.4  | 960.4  | 966.5  | 962.3  |
| 167.5° | 975.9  | 973.1  | 973.1  | 979.2  | 974.9  |
| 170°   | 986.7  | 984.3  | 983.4  | 989.4  | 984.3  |
| 172.5° | 994.3  | 991.9  | 990.9  | 997.0  | 991.9  |
| 175°   | 1000.4 | 997.9  | 996.1  | 1002.1 | 997.0  |
| 177.5° | 1003.7 | 1001.2 | 999.4  | 1004.6 | 999.4  |
| 180°   | 1002.1 | 1002.1 | 1002.1 | 1002.1 | 1002.1 |

TEST NUMBER: P913742

CATALOG NUMBER: DFN2DIP-HX4F0-120D040US927-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 | 12.99            | 14.16 | 13.67 | 14.86 | 15.68 | 12.55          | 13.73 | 13.24 | 14.43 | 15.25 |
|                 | 3H   | 14.67            | 15.72 | 15.37 | 16.44 | 17.29 | 14.20          | 15.25 | 14.89 | 15.96 | 16.82 |
|                 | 4H   | 15.27            | 16.27 | 15.99 | 16.99 | 17.86 | 14.80          | 15.79 | 15.51 | 16.52 | 17.38 |
|                 | 6H   | 15.69            | 16.61 | 16.42 | 17.34 | 18.22 | 15.21          | 16.13 | 15.94 | 16.86 | 17.75 |
|                 | 8H   | 15.80            | 16.68 | 16.54 | 17.43 | 18.32 | 15.33          | 16.20 | 16.07 | 16.95 | 17.84 |
|                 | 12H  | 15.86            | 16.70 | 16.61 | 17.44 | 18.36 | 15.38          | 16.22 | 16.13 | 16.96 | 17.87 |
| 4H              | 2H   | 13.48            | 14.48 | 14.20 | 15.20 | 16.07 | 13.14          | 14.13 | 13.86 | 14.86 | 15.73 |
|                 | 3H   | 15.38            | 16.21 | 16.11 | 16.97 | 17.86 | 14.99          | 15.82 | 15.72 | 16.58 | 17.46 |
|                 | 4H   | 16.11            | 16.86 | 16.86 | 17.62 | 18.54 | 15.70          | 16.46 | 16.45 | 17.22 | 18.13 |
|                 | 6H   | 16.64            | 17.29 | 17.41 | 18.08 | 19.00 | 16.23          | 16.89 | 17.00 | 17.67 | 18.60 |
|                 | 8H   | 16.80            | 17.41 | 17.57 | 18.19 | 19.13 | 16.39          | 17.00 | 17.16 | 17.78 | 18.72 |
|                 | 12H  | 16.89            | 17.44 | 17.68 | 18.24 | 19.18 | 16.46          | 17.01 | 17.26 | 17.82 | 18.76 |
| 8H              | 4H   | 16.33            | 16.94 | 17.10 | 17.72 | 18.66 | 15.97          | 16.58 | 16.74 | 17.36 | 18.30 |
|                 | 6H   | 16.97            | 17.48 | 17.77 | 18.31 | 19.24 | 16.61          | 17.12 | 17.41 | 17.94 | 18.88 |
|                 | 8H   | 17.20            | 17.65 | 18.01 | 18.47 | 19.43 | 16.83          | 17.28 | 17.64 | 18.10 | 19.06 |
|                 | 12H  | 17.35            | 17.74 | 18.16 | 18.56 | 19.57 | 16.96          | 17.36 | 17.78 | 18.17 | 19.18 |
| 12H             | 4H   | 16.33            | 16.88 | 17.12 | 17.68 | 18.63 | 15.98          | 16.53 | 16.77 | 17.33 | 18.27 |
|                 | 6H   | 17.01            | 17.46 | 17.82 | 18.28 | 19.24 | 16.66          | 17.11 | 17.47 | 17.93 | 18.88 |
|                 | 8H   | 17.26            | 17.66 | 18.08 | 18.48 | 19.49 | 16.91          | 17.31 | 17.72 | 18.12 | 19.13 |