

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: P907957

Luminaire Tested: DFN2DIP-HX2F0-060D020US840-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P907957  
REPORT IS A COMBINATION OF REPORTS P900680 AND P897595  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX2F0-060D020US840-RLLONL  
Description: 2 foot, Hexagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

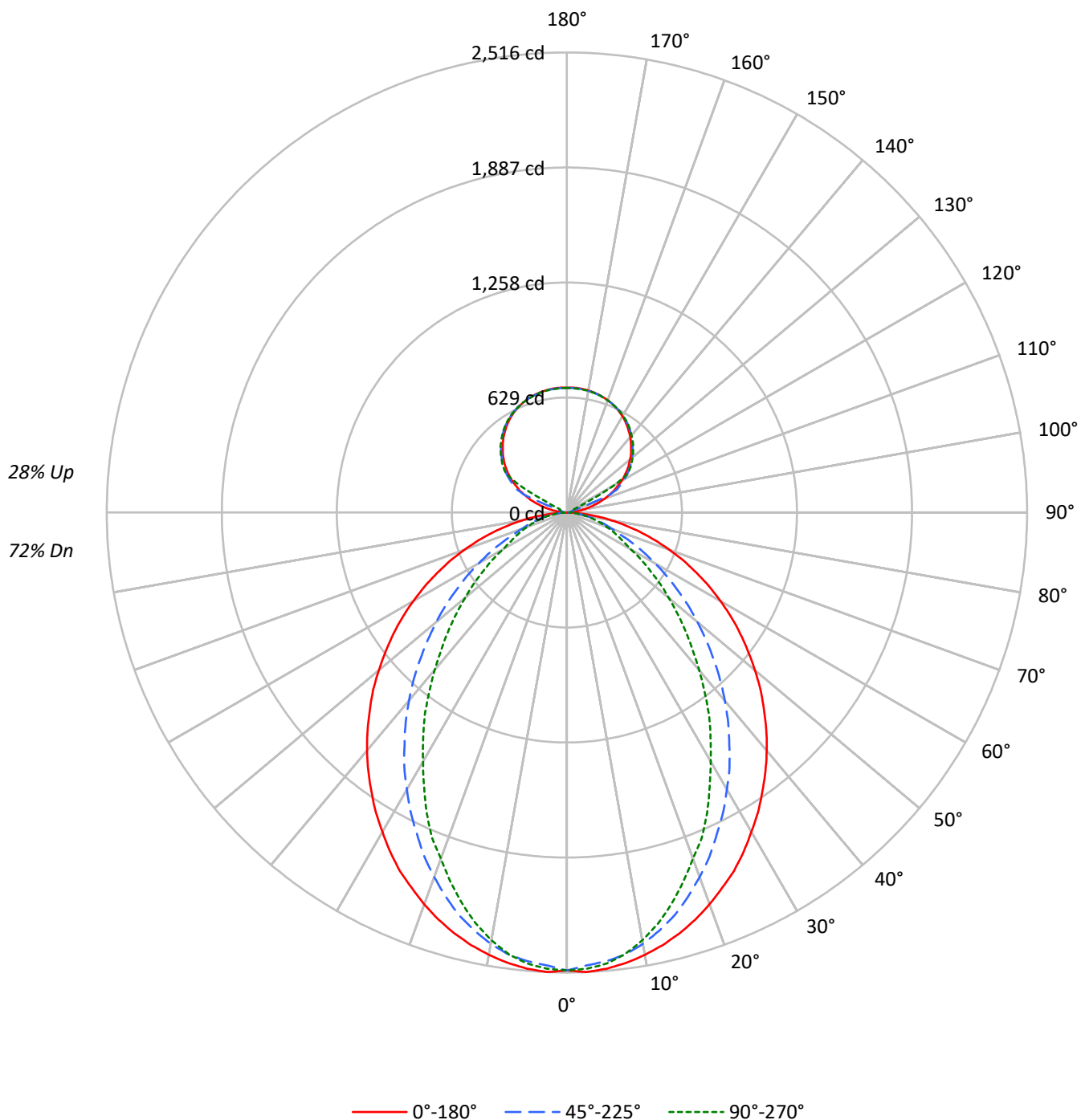
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 7149.8 lumens  
Efficiency: N/A  
Efficacy: 95.7 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 1.99' x L: 2.3' x H: 0.1')  
CIE Type: Semi-Direct  
  
Input Watts (W): 74.7  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9971  
Total Harmonic Distortion (THDi): 0.049  
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



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**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 | 0  |
| RCR |     |     |     |     |     |     |     |     |    |    |    |    |    |    |    |    |    |    |
| 0   | 112 | 112 | 112 | 112 | 107 | 107 | 107 | 107 | 96 | 96 | 96 | 86 | 86 | 86 | 76 | 76 | 76 | 72 |
| 1   | 103 | 99  | 95  | 92  | 98  | 94  | 91  | 88  | 85 | 82 | 80 | 76 | 75 | 73 | 69 | 67 | 66 | 62 |
| 2   | 95  | 87  | 81  | 76  | 90  | 83  | 78  | 73  | 75 | 71 | 68 | 68 | 65 | 62 | 61 | 59 | 57 | 53 |
| 3   | 87  | 78  | 70  | 65  | 82  | 74  | 67  | 62  | 67 | 62 | 58 | 61 | 57 | 53 | 55 | 52 | 49 | 46 |
| 4   | 80  | 69  | 61  | 55  | 76  | 66  | 59  | 54  | 60 | 54 | 50 | 55 | 50 | 46 | 50 | 46 | 43 | 40 |
| 5   | 74  | 62  | 54  | 48  | 70  | 59  | 52  | 47  | 54 | 48 | 44 | 50 | 45 | 41 | 45 | 41 | 38 | 35 |
| 6   | 68  | 56  | 48  | 42  | 65  | 54  | 46  | 41  | 49 | 43 | 39 | 45 | 40 | 36 | 41 | 37 | 34 | 31 |
| 7   | 63  | 51  | 43  | 38  | 60  | 49  | 42  | 36  | 45 | 39 | 34 | 41 | 36 | 32 | 38 | 34 | 30 | 28 |
| 8   | 59  | 47  | 39  | 34  | 56  | 45  | 38  | 33  | 41 | 35 | 31 | 38 | 33 | 29 | 35 | 31 | 27 | 25 |
| 9   | 55  | 43  | 35  | 30  | 52  | 41  | 34  | 30  | 38 | 32 | 28 | 35 | 30 | 26 | 32 | 28 | 25 | 23 |
| 10  | 52  | 40  | 32  | 28  | 49  | 38  | 31  | 27  | 35 | 29 | 25 | 33 | 28 | 24 | 30 | 26 | 23 | 21 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 5900 | 5900 | 5900 |
| 5°  | 5901 | 5793 | 5833 |
| 10° | 5833 | 5665 | 5632 |
| 15° | 5743 | 5464 | 5329 |
| 20° | 5627 | 5193 | 4961 |
| 25° | 5509 | 4892 | 4605 |
| 30° | 5353 | 4584 | 4158 |
| 35° | 5200 | 4255 | 3765 |
| 40° | 5044 | 3915 | 3317 |
| 45° | 4863 | 3541 | 2912 |
| 50° | 4675 | 3164 | 2516 |
| 55° | 4478 | 2764 | 2137 |
| 60° | 4250 | 2347 | 1749 |
| 65° | 3987 | 1925 | 1562 |
| 70° | 3667 | 1531 | 1399 |
| 75° | 3265 | 1323 | 1252 |
| 80° | 2687 | 1072 | 1054 |
| 85° | 1758 | 661  | 738  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 4863 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 234.7  | 3.3       |
| 10°-20°   | 644.3  | 9.0       |
| 20°-30°   | 904.6  | 12.7      |
| 30°-40°   | 986.1  | 13.8      |
| 40°-50°   | 906.3  | 12.7      |
| 50°-60°   | 711.7  | 10.0      |
| 60°-70°   | 463.3  | 6.5       |
| 70°-80°   | 238.5  | 3.3       |
| 80°-90°   | 62.1   | 0.9       |
| 90°-100°  | 22.5   | 0.3       |
| 100°-110° | 83.8   | 1.2       |
| 110°-120° | 222.2  | 3.1       |
| 120°-130° | 368.6  | 5.2       |
| 130°-140° | 391.5  | 5.5       |
| 140°-150° | 363.9  | 5.1       |
| 150°-160° | 292.5  | 4.1       |
| 160°-170° | 188.5  | 2.6       |
| 170°-180° | 64.9   | 0.9       |
| 0°-30°    | 1783.6 | 24.9      |
| 0°-40°    | 2769.6 | 38.7      |
| 0°-60°    | 4387.7 | 61.4      |
| 0°-90°    | 5151.5 | 72.1      |
| 90°-120°  | 328.5  | 4.6       |
| 90°-150°  | 1452.4 | 20.3      |
| 90°-180°  | 1998.0 | 27.9      |
| 0°-180°   | 7149.8 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2504 | 2504  | 2504 | 2504  | 2504 |      |
| 5°   | 2504 | 2493  | 2463 | 2484  | 2477 | 237  |
| 15°  | 2382 | 2357  | 2280 | 2237  | 2214 | 671  |
| 25°  | 2162 | 2090  | 1940 | 1847  | 1813 | 994  |
| 35°  | 1863 | 1747  | 1548 | 1405  | 1355 | 1166 |
| 45°  | 1523 | 1371  | 1133 | 972   | 918  | 1176 |
| 55°  | 1158 | 981   | 736  | 601   | 558  | 1035 |
| 65°  | 782  | 598   | 394  | 317   | 310  | 775  |
| 75°  | 417  | 258   | 181  | 165   | 163  | 441  |
| 85°  | 97   | 50    | 43   | 43    | 43   | 112  |
| 90°  | 0    | 6     | 10   | 12    | 13   | 7    |
| 95°  | 32   | 16    | 19   | 22    | 21   | 38   |
| 105° | 150  | 165   | 30   | 35    | 38   | 160  |
| 115° | 284  | 292   | 304  | 76    | 40   | 279  |
| 125° | 401  | 407   | 417  | 420   | 422  | 358  |
| 135° | 496  | 504   | 508  | 514   | 512  | 383  |
| 145° | 576  | 575   | 584  | 587   | 584  | 360  |
| 155° | 634  | 629   | 635  | 638   | 634  | 292  |
| 165° | 668  | 665   | 666  | 670   | 666  | 189  |
| 175° | 683  | 680   | 681  | 684   | 679  | 65   |
| 180° | 682  | 682   | 682  | 682   | 682  |      |

TEST NUMBER: P907957

CATALOG NUMBER: DFN2DIP-HX2F0-060D020US840-RLLONL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2504.3 | 2504.3 | 2504.3 | 2504.3 | 2504.3 |
| 2.5°   | 2515.6 | 2504.3 | 2479.2 | 2502.0 | 2497.5 |
| 5°     | 2504.3 | 2493.0 | 2463.4 | 2483.9 | 2477.1 |
| 7.5°   | 2483.9 | 2470.3 | 2438.6 | 2447.5 | 2436.2 |
| 10°    | 2456.6 | 2440.7 | 2395.6 | 2388.6 | 2375.1 |
| 12.5°  | 2422.8 | 2402.3 | 2341.0 | 2327.5 | 2302.5 |
| 15°    | 2381.9 | 2356.8 | 2279.9 | 2236.9 | 2214.2 |
| 17.5°  | 2334.3 | 2297.9 | 2202.7 | 2152.9 | 2116.7 |
| 20°    | 2279.9 | 2234.4 | 2121.2 | 2064.7 | 2014.7 |
| 22.5°  | 2221.0 | 2168.8 | 2037.3 | 1960.4 | 1926.4 |
| 25°    | 2162.1 | 2089.5 | 1940.0 | 1847.1 | 1813.0 |
| 27.5°  | 2091.9 | 2014.7 | 1849.3 | 1742.7 | 1690.6 |
| 30°    | 2017.1 | 1930.8 | 1749.5 | 1634.1 | 1572.8 |
| 32.5°  | 1944.5 | 1840.2 | 1654.6 | 1518.4 | 1461.7 |
| 35°    | 1863.0 | 1747.4 | 1548.0 | 1405.1 | 1355.1 |
| 37.5°  | 1783.6 | 1658.8 | 1448.2 | 1291.7 | 1235.2 |
| 40°    | 1699.7 | 1563.9 | 1343.8 | 1183.0 | 1124.1 |
| 42.5°  | 1613.7 | 1468.6 | 1239.7 | 1071.9 | 1015.4 |
| 45°    | 1523.0 | 1371.0 | 1133.3 | 972.1  | 917.8  |
| 47.5°  | 1436.9 | 1276.1 | 1031.3 | 870.2  | 820.4  |
| 50°    | 1341.7 | 1180.8 | 931.5  | 775.0  | 727.6  |
| 52.5°  | 1248.6 | 1078.6 | 836.3  | 686.7  | 643.7  |
| 55°    | 1158.0 | 981.3  | 736.5  | 600.7  | 557.5  |
| 57.5°  | 1065.2 | 883.8  | 648.2  | 521.3  | 484.9  |
| 60°    | 970.0  | 788.7  | 555.2  | 439.8  | 403.4  |
| 62.5°  | 877.2  | 695.9  | 475.8  | 367.2  | 349.1  |
| 65°    | 781.9  | 598.2  | 394.4  | 317.4  | 310.4  |
| 67.5°  | 691.3  | 507.6  | 317.4  | 278.7  | 272.0  |
| 70°    | 596.0  | 419.3  | 262.8  | 240.2  | 231.1  |
| 72.5°  | 505.4  | 337.6  | 219.7  | 201.8  | 197.1  |
| 75°    | 417.0  | 258.2  | 181.3  | 165.4  | 163.3  |
| 77.5°  | 328.7  | 183.5  | 142.8  | 133.7  | 129.2  |
| 80°    | 246.9  | 131.5  | 108.7  | 99.8   | 99.8   |
| 82.5°  | 172.2  | 88.5   | 74.7   | 70.2   | 70.2   |
| 85°    | 97.4   | 49.8   | 43.0   | 43.0   | 43.0   |
| 87.5°  | 36.4   | 18.1   | 18.1   | 15.9   | 15.9   |
| 90°    | 0.5    | 6.0    | 9.8    | 12.3   | 13.3   |
| 92.5°  | 12.3   | 10.4   | 11.8   | 12.8   | 13.3   |
| 95°    | 32.0   | 15.8   | 19.2   | 21.7   | 21.2   |
| 97.5°  | 57.7   | 17.3   | 25.1   | 26.7   | 27.2   |
| 100°   | 87.4   | 19.7   | 28.1   | 32.0   | 33.0   |
| 102.5° | 119.9  | 118.9  | 29.1   | 34.5   | 36.1   |
| 105°   | 150.0  | 164.7  | 30.1   | 35.4   | 37.5   |
| 107.5° | 185.0  | 197.2  | 31.1   | 36.5   | 38.5   |
| 110°   | 218.5  | 228.8  | 86.3   | 37.1   | 39.0   |

TEST NUMBER: P907957

CATALOG NUMBER: DFN2DIP-HX2F0-060D020US840-RLLONL

**CANDELA DISTRIBUTION (continued):**

|        | 0°    | 22.5° | 45°   | 67.5° | 90°   |
|--------|-------|-------|-------|-------|-------|
| 112.5° | 250.0 | 258.9 | 250.5 | 38.0  | 39.5  |
| 115°   | 283.6 | 292.0 | 304.4 | 75.9  | 40.5  |
| 117.5° | 312.7 | 322.6 | 330.9 | 260.4 | 131.2 |
| 120°   | 345.3 | 352.6 | 361.5 | 367.5 | 300.8 |
| 122.5° | 372.8 | 380.7 | 390.6 | 393.5 | 394.2 |
| 125°   | 401.0 | 407.4 | 416.8 | 420.2 | 421.7 |
| 127.5° | 426.7 | 433.5 | 441.0 | 445.9 | 446.4 |
| 130°   | 450.8 | 458.7 | 464.1 | 469.6 | 469.1 |
| 132.5° | 475.4 | 481.9 | 487.3 | 491.7 | 491.3 |
| 135°   | 496.2 | 504.1 | 508.5 | 513.5 | 512.5 |
| 137.5° | 517.9 | 523.8 | 528.8 | 533.7 | 532.2 |
| 140°   | 539.1 | 543.1 | 548.5 | 552.9 | 550.5 |
| 142.5° | 556.8 | 560.4 | 566.7 | 570.7 | 568.2 |
| 145°   | 575.6 | 575.1 | 583.5 | 586.9 | 584.5 |
| 147.5° | 591.9 | 590.4 | 598.7 | 601.2 | 599.3 |
| 150°   | 607.6 | 604.2 | 612.1 | 615.0 | 612.6 |
| 152.5° | 621.0 | 617.0 | 624.4 | 627.4 | 623.9 |
| 155°   | 633.8 | 629.3 | 635.3 | 638.2 | 634.3 |
| 157.5° | 644.2 | 640.3 | 644.7 | 648.1 | 644.2 |
| 160°   | 653.1 | 650.1 | 653.1 | 656.0 | 652.6 |
| 162.5° | 660.9 | 657.9 | 660.5 | 663.9 | 659.4 |
| 165°   | 667.8 | 664.9 | 666.3 | 669.8 | 666.3 |
| 167.5° | 673.3 | 670.2 | 671.8 | 675.3 | 670.8 |
| 170°   | 677.7 | 674.7 | 675.7 | 679.1 | 674.7 |
| 172.5° | 680.6 | 677.7 | 678.7 | 682.2 | 677.7 |
| 175°   | 683.1 | 679.6 | 680.6 | 684.1 | 679.1 |
| 177.5° | 684.1 | 680.6 | 681.2 | 684.6 | 680.1 |
| 180°   | 681.7 | 681.7 | 681.7 | 681.7 | 681.7 |

TEST NUMBER: P907957

CATALOG NUMBER: DFN2DIP-HX2F0-060D020US840-RLONL

**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 | 15.03            | 16.08 | 15.78 | 16.84 | 17.76 | 11.01          | 12.06 | 11.76 | 12.83 | 13.75 |
|                 | 3H   | 16.70            | 17.64 | 17.46 | 18.41 | 19.36 | 12.20          | 13.14 | 12.96 | 13.91 | 14.87 |
|                 | 4H   | 17.30            | 18.18 | 18.08 | 18.97 | 19.93 | 12.65          | 13.53 | 13.43 | 14.32 | 15.28 |
|                 | 6H   | 17.71            | 18.53 | 18.50 | 19.32 | 20.30 | 12.97          | 13.78 | 13.76 | 14.57 | 15.55 |
|                 | 8H   | 17.83            | 18.61 | 18.64 | 19.42 | 20.40 | 13.05          | 13.83 | 13.86 | 14.64 | 15.62 |
|                 | 12H  | 17.89            | 18.63 | 18.70 | 19.44 | 20.44 | 13.10          | 13.84 | 13.91 | 14.64 | 15.65 |
| 4H              | 2H   | 15.07            | 15.95 | 15.85 | 16.74 | 17.70 | 11.62          | 12.50 | 12.40 | 13.29 | 14.25 |
|                 | 3H   | 16.89            | 17.62 | 17.69 | 18.44 | 19.42 | 12.97          | 13.70 | 13.77 | 14.52 | 15.50 |
|                 | 4H   | 17.57            | 18.24 | 18.38 | 19.06 | 20.06 | 13.51          | 14.18 | 14.32 | 15.00 | 16.00 |
|                 | 6H   | 18.07            | 18.65 | 18.90 | 19.49 | 20.51 | 13.92          | 14.50 | 14.75 | 15.34 | 16.36 |
|                 | 8H   | 18.24            | 18.78 | 19.07 | 19.61 | 20.64 | 14.05          | 14.59 | 14.88 | 15.42 | 16.45 |
|                 | 12H  | 18.33            | 18.81 | 19.18 | 19.67 | 20.70 | 14.11          | 14.60 | 14.96 | 15.45 | 16.49 |
| 8H              | 4H   | 17.55            | 18.09 | 18.38 | 18.93 | 19.95 | 13.79          | 14.33 | 14.62 | 15.17 | 16.19 |
|                 | 6H   | 18.10            | 18.54 | 18.96 | 19.42 | 20.45 | 14.30          | 14.74 | 15.15 | 15.62 | 16.65 |
|                 | 8H   | 18.30            | 18.69 | 19.17 | 19.57 | 20.61 | 14.47          | 14.87 | 15.34 | 15.74 | 16.79 |
|                 | 12H  | 18.43            | 18.78 | 19.30 | 19.64 | 20.74 | 14.59          | 14.94 | 15.46 | 15.80 | 16.90 |
| 12H             | 4H   | 17.51            | 17.99 | 18.36 | 18.85 | 19.88 | 13.80          | 14.29 | 14.65 | 15.15 | 16.18 |
|                 | 6H   | 18.07            | 18.47 | 18.94 | 19.34 | 20.39 | 14.34          | 14.73 | 15.21 | 15.61 | 16.65 |
|                 | 8H   | 18.28            | 18.63 | 19.16 | 19.50 | 20.60 | 14.54          | 14.89 | 15.42 | 15.76 | 16.86 |