

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: P916063

Luminaire Tested: DFN2DIP-HX2F0-020D030US930-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P916063  
REPORT IS A COMBINATION OF REPORTS P900681 AND P897595  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX2F0-020D030US930-FLLONL  
Description: 2 foot, Hexagon Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

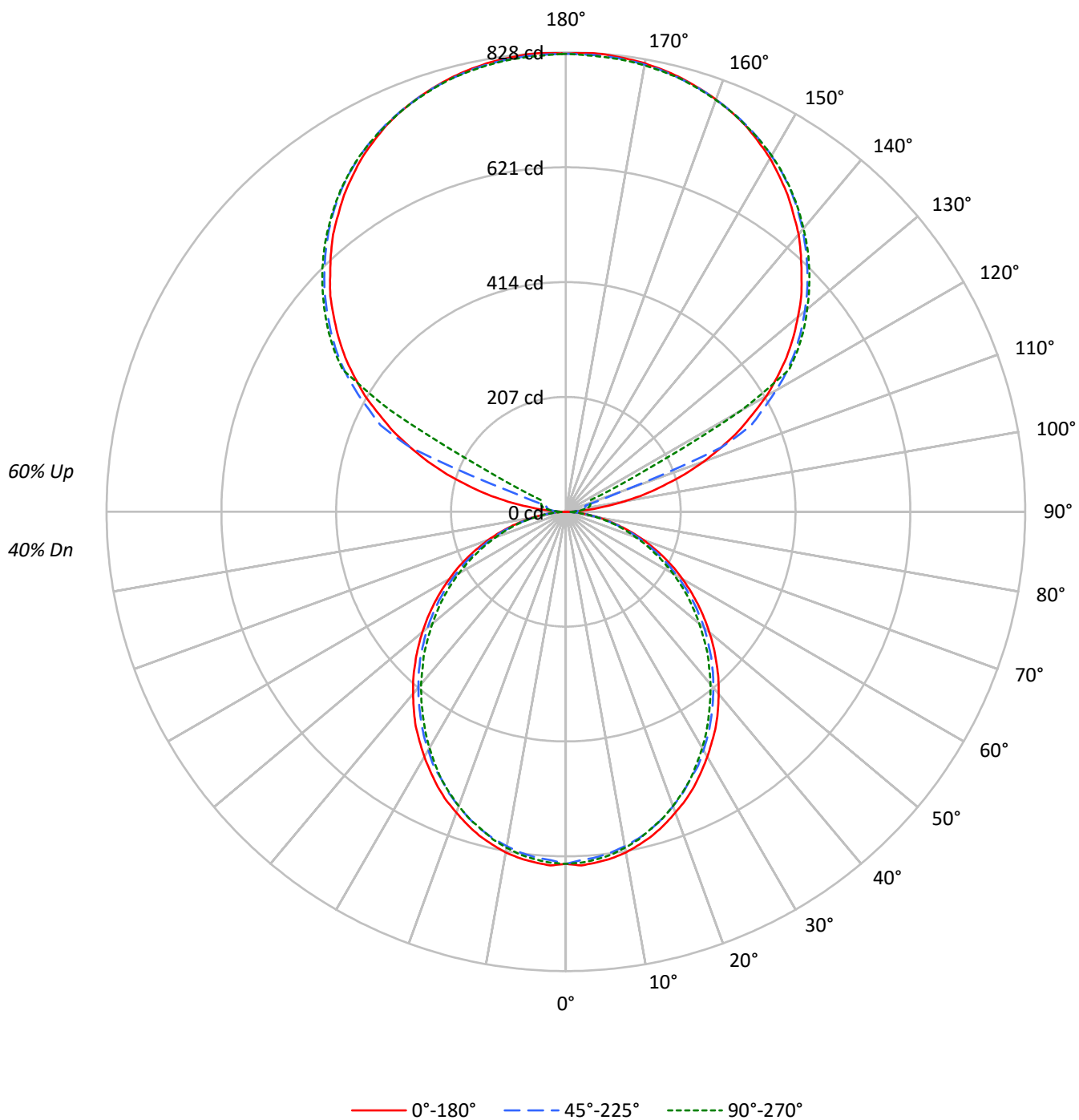
Lumens per Lamp: N/A  
Luminaire Lumens: 4035.7 lumens  
Efficiency: N/A  
Efficacy: 109.1 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 1.99' x L: 2.3' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 37  
Input Voltage (V): 120  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9968  
Total Harmonic Distortion (THDi): 0.064  
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 |
| RCR |     |     |     |     |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 0   | 105 | 105 | 105 | 105 | 95 | 95 | 95 | 95 | 78 | 78 | 78 | 62 | 62 | 62 | 47 | 47 | 47 |
| 1   | 96  | 91  | 87  | 84  | 87 | 83 | 80 | 77 | 68 | 66 | 64 | 54 | 53 | 51 | 41 | 41 | 40 |
| 2   | 87  | 80  | 74  | 69  | 79 | 73 | 68 | 63 | 60 | 56 | 53 | 48 | 45 | 43 | 37 | 35 | 33 |
| 3   | 79  | 70  | 63  | 57  | 72 | 64 | 58 | 53 | 53 | 48 | 44 | 42 | 39 | 36 | 32 | 30 | 28 |
| 4   | 73  | 62  | 54  | 48  | 66 | 57 | 50 | 45 | 47 | 42 | 38 | 37 | 34 | 31 | 29 | 26 | 24 |
| 5   | 67  | 55  | 47  | 41  | 60 | 50 | 44 | 38 | 42 | 37 | 33 | 34 | 30 | 27 | 26 | 23 | 21 |
| 6   | 61  | 49  | 41  | 36  | 56 | 45 | 38 | 33 | 38 | 32 | 28 | 30 | 26 | 23 | 24 | 21 | 19 |
| 7   | 57  | 45  | 37  | 31  | 51 | 41 | 34 | 29 | 34 | 29 | 25 | 28 | 24 | 21 | 22 | 19 | 17 |
| 8   | 52  | 40  | 33  | 27  | 48 | 37 | 30 | 26 | 31 | 26 | 22 | 25 | 21 | 18 | 20 | 17 | 15 |
| 9   | 49  | 37  | 29  | 24  | 44 | 34 | 27 | 23 | 28 | 23 | 20 | 23 | 19 | 17 | 18 | 15 | 13 |
| 10  | 46  | 34  | 27  | 22  | 41 | 31 | 25 | 20 | 26 | 21 | 18 | 21 | 18 | 15 | 17 | 14 | 12 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1495 | 1495 | 1495 |
| 5°  | 1495 | 1470 | 1481 |
| 10° | 1480 | 1447 | 1458 |
| 15° | 1456 | 1420 | 1424 |
| 20° | 1424 | 1383 | 1389 |
| 25° | 1393 | 1340 | 1350 |
| 30° | 1354 | 1300 | 1300 |
| 35° | 1317 | 1253 | 1248 |
| 40° | 1271 | 1205 | 1197 |
| 45° | 1225 | 1157 | 1146 |
| 50° | 1176 | 1107 | 1087 |
| 55° | 1123 | 1048 | 1031 |
| 60° | 1064 | 980  | 968  |
| 65° | 998  | 908  | 894  |
| 70° | 916  | 821  | 813  |
| 75° | 803  | 717  | 734  |
| 80° | 665  | 584  | 592  |
| 85° | 449  | 366  | 367  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 1225 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 59.7   | 1.5       |
| 10°-20°   | 168.0  | 4.2       |
| 20°-30°   | 246.9  | 6.1       |
| 30°-40°   | 286.8  | 7.1       |
| 40°-50°   | 286.4  | 7.1       |
| 50°-60°   | 249.7  | 6.2       |
| 60°-70°   | 184.6  | 4.6       |
| 70°-80°   | 104.5  | 2.6       |
| 80°-90°   | 29.0   | 0.7       |
| 90°-100°  | 27.2   | 0.7       |
| 100°-110° | 101.5  | 2.5       |
| 110°-120° | 269.1  | 6.7       |
| 120°-130° | 446.3  | 11.1      |
| 130°-140° | 474.1  | 11.7      |
| 140°-150° | 440.6  | 10.9      |
| 150°-160° | 354.3  | 8.8       |
| 160°-170° | 228.3  | 5.7       |
| 170°-180° | 78.6   | 1.9       |
| 0°-30°    | 474.7  | 11.8      |
| 0°-40°    | 761.5  | 18.9      |
| 0°-60°    | 1297.6 | 32.2      |
| 0°-90°    | 1615.8 | 40.0      |
| 90°-120°  | 397.8  | 9.9       |
| 90°-150°  | 1758.9 | 43.6      |
| 90°-180°  | 2420.0 | 60.0      |
| 0°-180°   | 4035.7 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°  | 22.5° | 45° | 67.5° | 90° | Flux |
|------|-----|-------|-----|-------|-----|------|
| 0°   | 634 | 634   | 634 | 634   | 634 |      |
| 5°   | 634 | 632   | 625 | 630   | 629 | 60   |
| 15°  | 604 | 600   | 592 | 595   | 592 | 170  |
| 25°  | 547 | 542   | 531 | 533   | 531 | 252  |
| 35°  | 472 | 466   | 456 | 452   | 449 | 295  |
| 45°  | 384 | 380   | 370 | 364   | 361 | 296  |
| 55°  | 290 | 287   | 279 | 272   | 269 | 260  |
| 65°  | 196 | 192   | 186 | 181   | 178 | 194  |
| 75°  | 102 | 101   | 98  | 95    | 96  | 109  |
| 85°  | 25  | 24    | 24  | 22    | 21  | 28   |
| 90°  | 1   | 7     | 12  | 15    | 16  | 4    |
| 95°  | 39  | 19    | 23  | 26    | 26  | 46   |
| 105° | 182 | 200   | 36  | 43    | 45  | 194  |
| 115° | 343 | 354   | 368 | 92    | 49  | 338  |
| 125° | 486 | 493   | 505 | 509   | 511 | 433  |
| 135° | 601 | 610   | 616 | 622   | 621 | 464  |
| 145° | 697 | 696   | 707 | 711   | 708 | 436  |
| 155° | 768 | 762   | 769 | 773   | 768 | 354  |
| 165° | 809 | 805   | 807 | 811   | 807 | 228  |
| 175° | 827 | 823   | 824 | 828   | 822 | 79   |
| 180° | 826 | 826   | 826 | 826   | 826 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°    | 22.5° | 45°   | 67.5° | 90°   |
|--------|-------|-------|-------|-------|-------|
| 0°     | 634.5 | 634.5 | 634.5 | 634.5 | 634.5 |
| 2.5°   | 638.1 | 635.1 | 628.4 | 634.5 | 633.3 |
| 5°     | 634.5 | 632.1 | 625.3 | 630.2 | 629.0 |
| 7.5°   | 630.2 | 626.6 | 619.9 | 624.8 | 623.5 |
| 10°    | 623.5 | 619.3 | 612.0 | 616.8 | 615.0 |
| 12.5°  | 614.3 | 610.7 | 603.4 | 606.4 | 605.2 |
| 15°    | 604.0 | 600.4 | 592.4 | 594.8 | 591.8 |
| 17.5°  | 591.2 | 587.6 | 579.6 | 582.6 | 579.6 |
| 20°    | 577.1 | 573.5 | 564.9 | 566.8 | 564.3 |
| 22.5°  | 563.1 | 557.7 | 549.7 | 549.7 | 548.5 |
| 25°    | 546.7 | 541.8 | 531.4 | 532.6 | 531.4 |
| 27.5°  | 528.3 | 524.1 | 516.2 | 514.4 | 511.3 |
| 30°    | 510.1 | 505.2 | 496.0 | 494.2 | 491.7 |
| 32.5°  | 490.5 | 486.9 | 477.1 | 473.4 | 471.0 |
| 35°    | 471.7 | 465.5 | 455.8 | 452.1 | 449.0 |
| 37.5°  | 450.3 | 444.7 | 435.0 | 430.7 | 427.6 |
| 40°    | 428.3 | 423.4 | 413.6 | 408.2 | 405.7 |
| 42.5°  | 406.9 | 402.0 | 392.3 | 386.2 | 382.5 |
| 45°    | 383.8 | 379.5 | 370.3 | 363.6 | 361.2 |
| 47.5°  | 361.2 | 356.9 | 347.2 | 340.4 | 336.8 |
| 50°    | 337.4 | 334.4 | 325.8 | 317.2 | 314.2 |
| 52.5°  | 314.2 | 309.9 | 302.0 | 295.3 | 291.1 |
| 55°    | 290.4 | 286.7 | 279.4 | 272.1 | 269.0 |
| 57.5°  | 266.6 | 263.6 | 255.6 | 248.3 | 245.8 |
| 60°    | 242.8 | 240.4 | 231.9 | 225.1 | 223.3 |
| 62.5°  | 219.6 | 215.3 | 209.3 | 203.2 | 200.7 |
| 65°    | 195.8 | 192.2 | 186.1 | 180.6 | 177.6 |
| 67.5°  | 171.5 | 168.4 | 162.9 | 158.7 | 156.2 |
| 70°    | 148.9 | 146.4 | 140.9 | 136.6 | 134.3 |
| 72.5°  | 125.7 | 123.3 | 120.2 | 115.9 | 114.1 |
| 75°    | 102.5 | 101.3 | 98.2  | 94.6  | 95.8  |
| 77.5°  | 81.8  | 79.3  | 78.0  | 76.2  | 74.4  |
| 80°    | 61.1  | 60.4  | 59.2  | 57.3  | 56.1  |
| 82.5°  | 41.5  | 41.5  | 40.9  | 38.5  | 38.5  |
| 85°    | 24.9  | 24.4  | 23.8  | 21.9  | 21.4  |
| 87.5°  | 11.0  | 9.8   | 8.6   | 6.8   | 6.1   |
| 90°    | 0.6   | 7.2   | 11.9  | 15.0  | 16.1  |
| 92.5°  | 15.0  | 12.6  | 14.3  | 15.6  | 16.1  |
| 95°    | 38.8  | 19.1  | 23.2  | 26.3  | 25.7  |
| 97.5°  | 69.9  | 21.0  | 30.4  | 32.3  | 32.9  |
| 100°   | 105.7 | 23.9  | 34.1  | 38.8  | 40.0  |
| 102.5° | 145.1 | 144.0 | 35.2  | 41.7  | 43.6  |
| 105°   | 181.6 | 199.5 | 36.4  | 43.0  | 45.4  |
| 107.5° | 224.0 | 238.9 | 37.7  | 44.2  | 46.6  |
| 110°   | 264.6 | 277.1 | 104.5 | 44.8  | 47.2  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°    | 22.5° | 45°   | 67.5° | 90°   |
|--------|-------|-------|-------|-------|-------|
| 112.5° | 302.9 | 313.6 | 303.5 | 46.0  | 47.8  |
| 115°   | 343.4 | 353.6 | 368.5 | 92.0  | 49.0  |
| 117.5° | 378.7 | 390.6 | 400.8 | 315.4 | 158.9 |
| 120°   | 418.1 | 427.1 | 437.8 | 445.0 | 364.4 |
| 122.5° | 451.5 | 461.1 | 473.1 | 476.6 | 477.3 |
| 125°   | 485.6 | 493.3 | 504.8 | 508.9 | 510.7 |
| 127.5° | 516.7 | 525.0 | 534.0 | 540.0 | 540.5 |
| 130°   | 545.9 | 555.5 | 562.1 | 568.6 | 568.1 |
| 132.5° | 575.8 | 583.6 | 590.1 | 595.5 | 594.9 |
| 135°   | 600.9 | 610.5 | 615.8 | 621.8 | 620.6 |
| 137.5° | 627.1 | 634.3 | 640.3 | 646.3 | 644.5 |
| 140°   | 652.8 | 657.6 | 664.1 | 669.5 | 666.6 |
| 142.5° | 674.4 | 678.6 | 686.3 | 691.0 | 688.1 |
| 145°   | 697.1 | 696.4 | 706.6 | 710.8 | 707.8 |
| 147.5° | 716.7 | 714.9 | 725.1 | 728.1 | 725.7 |
| 150°   | 735.9 | 731.7 | 741.3 | 744.8 | 741.8 |
| 152.5° | 751.9 | 747.2 | 756.2 | 759.8 | 755.6 |
| 155°   | 767.5 | 762.2 | 769.3 | 772.9 | 768.2 |
| 157.5° | 780.1 | 775.3 | 780.7 | 784.9 | 780.1 |
| 160°   | 790.8 | 787.3 | 790.8 | 794.4 | 790.2 |
| 162.5° | 800.4 | 796.8 | 799.8 | 804.0 | 798.6 |
| 165°   | 808.7 | 805.2 | 807.0 | 811.1 | 807.0 |
| 167.5° | 815.3 | 811.7 | 813.5 | 817.7 | 812.4 |
| 170°   | 820.7 | 817.1 | 818.3 | 822.5 | 817.1 |
| 172.5° | 824.3 | 820.7 | 821.9 | 826.1 | 820.7 |
| 175°   | 827.2 | 823.0 | 824.3 | 828.4 | 822.5 |
| 177.5° | 828.4 | 824.3 | 824.9 | 829.1 | 823.7 |
| 180°   | 825.5 | 825.5 | 825.5 | 825.5 | 825.5 |

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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 | 7.54             | 8.31  | 8.57  | 9.36  | 10.76 | 7.11           | 7.89  | 8.15  | 8.93  | 10.34 |
|                 | 3H   | 9.16             | 9.86  | 10.21 | 10.92 | 12.34 | 8.70           | 9.40  | 9.75  | 10.45 | 11.88 |
|                 | 4H   | 9.73             | 10.39 | 10.79 | 11.45 | 12.88 | 9.27           | 9.93  | 10.33 | 10.99 | 12.42 |
|                 | 6H   | 10.11            | 10.72 | 11.18 | 11.78 | 13.22 | 9.65           | 10.26 | 10.72 | 11.32 | 12.76 |
|                 | 8H   | 10.20            | 10.78 | 11.27 | 11.86 | 13.30 | 9.74           | 10.32 | 10.82 | 11.40 | 12.84 |
|                 | 12H  | 10.24            | 10.79 | 11.32 | 11.86 | 13.32 | 9.77           | 10.32 | 10.85 | 11.39 | 12.86 |
| 4H              | 2H   | 7.98             | 8.64  | 9.04  | 9.69  | 11.13 | 7.64           | 8.30  | 8.70  | 9.35  | 10.79 |
|                 | 3H   | 9.81             | 10.36 | 10.88 | 11.44 | 12.89 | 9.42           | 9.97  | 10.50 | 11.06 | 12.50 |
|                 | 4H   | 10.50            | 11.00 | 11.58 | 12.08 | 13.54 | 10.10          | 10.61 | 11.18 | 11.68 | 13.15 |
|                 | 6H   | 10.98            | 11.42 | 12.07 | 12.52 | 13.98 | 10.59          | 11.02 | 11.68 | 12.12 | 13.58 |
|                 | 8H   | 11.12            | 11.53 | 12.21 | 12.61 | 14.09 | 10.72          | 11.13 | 11.81 | 12.22 | 13.69 |
|                 | 12H  | 11.18            | 11.54 | 12.28 | 12.65 | 14.13 | 10.77          | 11.14 | 11.88 | 12.24 | 13.72 |
| 8H              | 4H   | 10.68            | 11.08 | 11.76 | 12.17 | 13.65 | 10.32          | 10.73 | 11.41 | 11.82 | 13.30 |
|                 | 6H   | 11.27            | 11.61 | 12.39 | 12.74 | 14.21 | 10.92          | 11.26 | 12.03 | 12.39 | 13.86 |
|                 | 8H   | 11.48            | 11.77 | 12.60 | 12.88 | 14.38 | 11.12          | 11.42 | 12.24 | 12.53 | 14.02 |
|                 | 12H  | 11.59            | 11.85 | 12.71 | 12.96 | 14.49 | 11.22          | 11.48 | 12.34 | 12.59 | 14.12 |
| 12H             | 4H   | 10.66            | 11.02 | 11.76 | 12.12 | 13.61 | 10.31          | 10.68 | 11.42 | 11.78 | 13.26 |
|                 | 6H   | 11.30            | 11.59 | 12.42 | 12.71 | 14.20 | 10.96          | 11.25 | 12.07 | 12.36 | 13.86 |
|                 | 8H   | 11.52            | 11.78 | 12.64 | 12.89 | 14.42 | 11.17          | 11.43 | 12.29 | 12.54 | 14.07 |