

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: P916489

Luminaire Tested: DFN2DIP-PN2F0-020D020US930-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P916489  
REPORT IS A COMBINATION OF REPORTS P900981 AND P897905  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN2F0-020D020US930-FLLONL  
Description: 2 foot, Pentagon Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

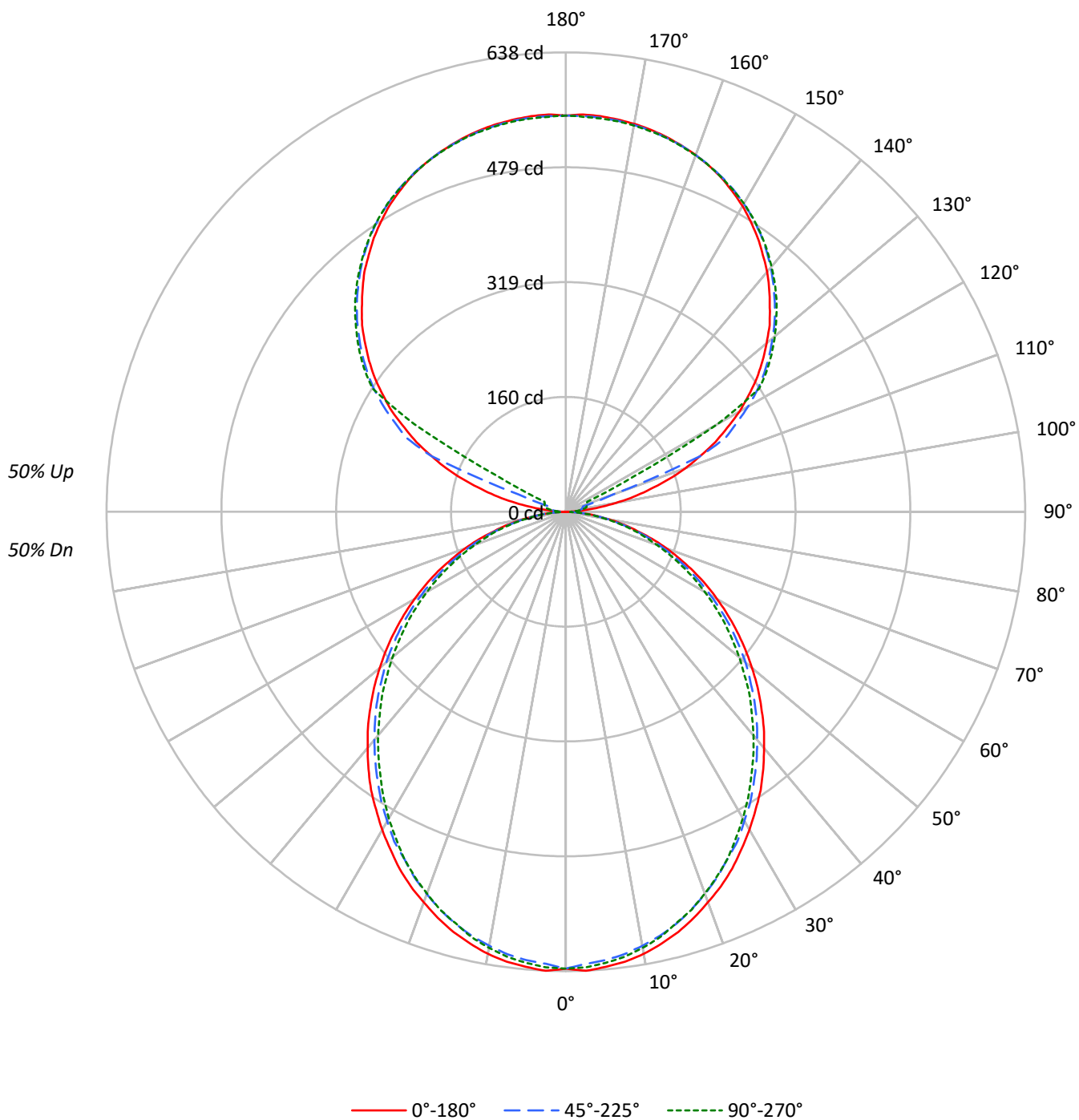
Lumens per Lamp: N/A  
Luminaire Lumens: 3228.6 lumens  
Efficiency: N/A  
Efficacy: 100.0 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 2.17' x L: 2.29' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 32.3  
Input Voltage (V): 120  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.099  
Total Harmonic Distortion (THDi): 0.979  
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   | 107 | 107 | 107 | 107 | 99 | 99 | 99 | 99 | 83 | 83 | 83 | 69 | 69 | 69 | 56 | 56 | 56 |
| 1   | 98  | 93  | 90  | 86  | 90 | 86 | 83 | 80 | 73 | 71 | 68 | 61 | 59 | 58 | 50 | 48 | 47 |
| 2   | 89  | 82  | 75  | 70  | 82 | 76 | 70 | 66 | 64 | 60 | 57 | 53 | 51 | 48 | 44 | 42 | 40 |
| 3   | 81  | 72  | 64  | 59  | 75 | 66 | 60 | 55 | 56 | 52 | 48 | 47 | 44 | 41 | 39 | 36 | 34 |
| 4   | 74  | 64  | 56  | 50  | 68 | 59 | 52 | 47 | 50 | 45 | 41 | 42 | 38 | 35 | 35 | 32 | 29 |
| 5   | 68  | 57  | 48  | 42  | 63 | 53 | 45 | 40 | 45 | 39 | 35 | 38 | 34 | 30 | 31 | 28 | 26 |
| 6   | 63  | 51  | 43  | 37  | 58 | 47 | 40 | 35 | 40 | 35 | 31 | 34 | 30 | 27 | 28 | 25 | 23 |
| 7   | 58  | 46  | 38  | 32  | 53 | 43 | 36 | 30 | 37 | 31 | 27 | 31 | 27 | 23 | 26 | 23 | 20 |
| 8   | 54  | 42  | 34  | 29  | 50 | 39 | 32 | 27 | 33 | 28 | 24 | 28 | 24 | 21 | 24 | 20 | 18 |
| 9   | 50  | 38  | 30  | 25  | 46 | 35 | 29 | 24 | 31 | 25 | 21 | 26 | 22 | 19 | 22 | 19 | 16 |
| 10  | 47  | 35  | 28  | 23  | 43 | 33 | 26 | 22 | 28 | 23 | 19 | 24 | 20 | 17 | 20 | 17 | 15 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1374 | 1374 | 1374 |
| 5°  | 1374 | 1352 | 1362 |
| 10° | 1361 | 1331 | 1342 |
| 15° | 1339 | 1306 | 1311 |
| 20° | 1309 | 1273 | 1279 |
| 25° | 1280 | 1233 | 1243 |
| 30° | 1244 | 1197 | 1198 |
| 35° | 1210 | 1154 | 1150 |
| 40° | 1168 | 1110 | 1104 |
| 45° | 1126 | 1067 | 1058 |
| 50° | 1081 | 1021 | 1004 |
| 55° | 1032 | 967  | 953  |
| 60° | 978  | 905  | 896  |
| 65° | 917  | 839  | 828  |
| 70° | 842  | 760  | 755  |
| 75° | 737  | 664  | 684  |
| 80° | 611  | 543  | 555  |
| 85° | 413  | 343  | 349  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 1126 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 59.7   | 1.8       |
| 10°-20°   | 168.0  | 5.2       |
| 20°-30°   | 246.9  | 7.6       |
| 30°-40°   | 286.8  | 8.9       |
| 40°-50°   | 286.4  | 8.9       |
| 50°-60°   | 249.7  | 7.7       |
| 60°-70°   | 184.6  | 5.7       |
| 70°-80°   | 104.5  | 3.2       |
| 80°-90°   | 28.5   | 0.9       |
| 90°-100°  | 18.1   | 0.6       |
| 100°-110° | 67.6   | 2.1       |
| 110°-120° | 179.4  | 5.6       |
| 120°-130° | 297.6  | 9.2       |
| 130°-140° | 316.1  | 9.8       |
| 140°-150° | 293.8  | 9.1       |
| 150°-160° | 236.2  | 7.3       |
| 160°-170° | 152.2  | 4.7       |
| 170°-180° | 52.4   | 1.6       |
| 0°-30°    | 474.7  | 14.7      |
| 0°-40°    | 761.5  | 23.6      |
| 0°-60°    | 1297.6 | 40.2      |
| 0°-90°    | 1615.3 | 50.0      |
| 90°-120°  | 265.2  | 8.2       |
| 90°-150°  | 1172.6 | 36.3      |
| 90°-180°  | 1613.0 | 50.0      |
| 0°-180°   | 3228.6 | 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°  | 0   | 5     | 8   | 10    | 11  | 3    |
| 95°  | 26  | 13    | 16  | 18    | 17  | 31   |
| 105° | 121 | 133   | 24  | 29    | 30  | 129  |
| 115° | 229 | 236   | 246 | 61    | 33  | 225  |
| 125° | 324 | 329   | 336 | 339   | 340 | 289  |
| 135° | 401 | 407   | 410 | 415   | 414 | 309  |
| 145° | 465 | 464   | 471 | 474   | 472 | 291  |
| 155° | 512 | 508   | 513 | 515   | 512 | 236  |
| 165° | 539 | 537   | 538 | 541   | 538 | 152  |
| 175° | 552 | 549   | 550 | 552   | 548 | 52   |
| 180° | 550 | 550   | 550 | 550   | 550 |      |

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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°    | 0.4   | 4.8   | 7.9   | 9.9   | 10.8  |
| 92.5°  | 9.9   | 8.4   | 9.5   | 10.4  | 10.8  |
| 95°    | 25.8  | 12.7  | 15.5  | 17.5  | 17.1  |
| 97.5°  | 46.6  | 13.9  | 20.3  | 21.5  | 21.9  |
| 100°   | 70.5  | 15.9  | 22.7  | 25.8  | 26.7  |
| 102.5° | 96.8  | 96.0  | 23.5  | 27.9  | 29.1  |
| 105°   | 121.1 | 133.0 | 24.3  | 28.6  | 30.2  |
| 107.5° | 149.4 | 159.2 | 25.1  | 29.4  | 31.1  |
| 110°   | 176.4 | 184.7 | 69.7  | 29.9  | 31.5  |



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**CANDELA DISTRIBUTION (continued):**

|        | 0°    | 22.5° | 45°   | 67.5° | 90°   |
|--------|-------|-------|-------|-------|-------|
| 112.5° | 201.9 | 209.0 | 202.3 | 30.7  | 31.9  |
| 115°   | 228.9 | 235.7 | 245.7 | 61.3  | 32.7  |
| 117.5° | 252.4 | 260.4 | 267.2 | 210.3 | 105.9 |
| 120°   | 278.8 | 284.7 | 291.9 | 296.7 | 242.9 |
| 122.5° | 301.0 | 307.4 | 315.4 | 317.7 | 318.2 |
| 125°   | 323.8 | 328.9 | 336.5 | 339.2 | 340.5 |
| 127.5° | 344.5 | 350.0 | 356.0 | 360.0 | 360.4 |
| 130°   | 363.9 | 370.3 | 374.7 | 379.1 | 378.7 |
| 132.5° | 383.8 | 389.1 | 393.4 | 397.0 | 396.6 |
| 135°   | 400.6 | 407.0 | 410.5 | 414.6 | 413.8 |
| 137.5° | 418.1 | 422.9 | 426.9 | 430.9 | 429.7 |
| 140°   | 435.2 | 438.5 | 442.8 | 446.4 | 444.4 |
| 142.5° | 449.6 | 452.4 | 457.5 | 460.7 | 458.7 |
| 145°   | 464.7 | 464.3 | 471.1 | 473.9 | 471.9 |
| 147.5° | 477.8 | 476.6 | 483.4 | 485.3 | 483.8 |
| 150°   | 490.6 | 487.8 | 494.2 | 496.5 | 494.6 |
| 152.5° | 501.3 | 498.1 | 504.1 | 506.5 | 503.7 |
| 155°   | 511.7 | 508.1 | 512.9 | 515.3 | 512.1 |
| 157.5° | 520.1 | 516.9 | 520.5 | 523.3 | 520.1 |
| 160°   | 527.3 | 524.8 | 527.3 | 529.6 | 526.8 |
| 162.5° | 533.5 | 531.2 | 533.2 | 536.0 | 532.4 |
| 165°   | 539.2 | 536.8 | 537.9 | 540.8 | 537.9 |
| 167.5° | 543.6 | 541.1 | 542.3 | 545.2 | 541.5 |
| 170°   | 547.1 | 544.7 | 545.5 | 548.3 | 544.7 |
| 172.5° | 549.5 | 547.1 | 548.0 | 550.7 | 547.1 |
| 175°   | 551.5 | 548.7 | 549.5 | 552.3 | 548.3 |
| 177.5° | 552.3 | 549.5 | 549.9 | 552.7 | 549.1 |
| 180°   | 550.3 | 550.3 | 550.3 | 550.3 | 550.3 |

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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 | 8.26             | 9.12  | 9.22  | 10.10 | 11.37 | 7.83           | 8.69  | 8.78  | 9.66  | 10.93 |
|                 | 3H   | 9.90             | 10.68 | 10.87 | 11.66 | 12.95 | 9.42           | 10.20 | 10.39 | 11.18 | 12.47 |
|                 | 4H   | 10.48            | 11.21 | 11.46 | 12.19 | 13.50 | 9.99           | 10.73 | 10.98 | 11.71 | 13.01 |
|                 | 6H   | 10.86            | 11.54 | 11.85 | 12.53 | 13.84 | 10.37          | 11.05 | 11.37 | 12.04 | 13.35 |
|                 | 8H   | 10.96            | 11.60 | 11.96 | 12.61 | 13.92 | 10.47          | 11.11 | 11.47 | 12.12 | 13.43 |
|                 | 12H  | 11.00            | 11.61 | 12.00 | 12.61 | 13.95 | 10.51          | 11.12 | 11.51 | 12.12 | 13.45 |
| 4H              | 2H   | 8.71             | 9.45  | 9.70  | 10.43 | 11.73 | 8.36           | 9.10  | 9.35  | 10.08 | 11.38 |
|                 | 3H   | 10.56            | 11.17 | 11.55 | 12.18 | 13.50 | 10.16          | 10.77 | 11.15 | 11.78 | 13.10 |
|                 | 4H   | 11.25            | 11.81 | 12.26 | 12.82 | 14.16 | 10.84          | 11.40 | 11.85 | 12.41 | 13.74 |
|                 | 6H   | 11.75            | 12.23 | 12.77 | 13.26 | 14.60 | 11.33          | 11.81 | 12.35 | 12.84 | 14.18 |
|                 | 8H   | 11.89            | 12.34 | 12.91 | 13.36 | 14.71 | 11.47          | 11.92 | 12.48 | 12.94 | 14.29 |
|                 | 12H  | 11.95            | 12.36 | 12.99 | 13.40 | 14.76 | 11.52          | 11.93 | 12.56 | 12.96 | 14.32 |
| 8H              | 4H   | 11.44            | 11.89 | 12.46 | 12.91 | 14.26 | 11.07          | 11.52 | 12.09 | 12.54 | 13.89 |
|                 | 6H   | 12.05            | 12.42 | 13.09 | 13.48 | 14.83 | 11.67          | 12.04 | 12.71 | 13.11 | 14.46 |
|                 | 8H   | 12.25            | 12.58 | 13.30 | 13.63 | 15.00 | 11.87          | 12.20 | 12.92 | 13.25 | 14.62 |
|                 | 12H  | 12.37            | 12.66 | 13.43 | 13.71 | 15.12 | 11.98          | 12.26 | 13.03 | 13.31 | 14.72 |
| 12H             | 4H   | 11.42            | 11.83 | 12.46 | 12.87 | 14.22 | 11.06          | 11.47 | 12.10 | 12.51 | 13.86 |
|                 | 6H   | 12.07            | 12.40 | 13.12 | 13.45 | 14.82 | 11.71          | 12.04 | 12.76 | 13.09 | 14.45 |
|                 | 8H   | 12.30            | 12.59 | 13.35 | 13.63 | 15.04 | 11.93          | 12.22 | 12.98 | 13.26 | 14.67 |