

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: P921234

Luminaire Tested: DFN2DIP-4P2F0-020D020US940-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P921234  
REPORT IS A COMBINATION OF REPORTS P899011 AND P895899  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-4P2F0-020D020US940-FLLFLL  
Description: 2 foot, 90deg - 4way Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

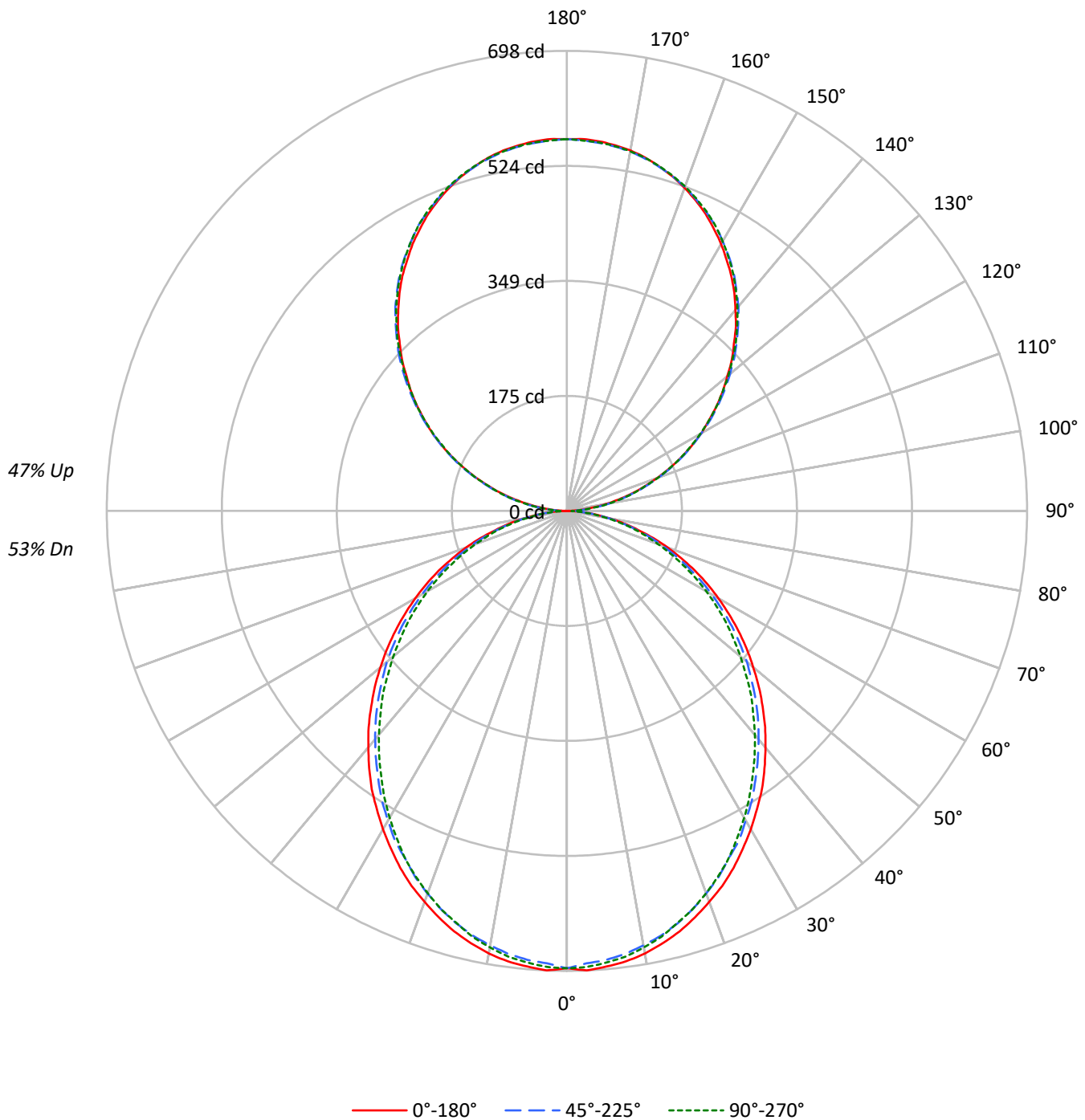
Lumens per Lamp: N/A  
Luminaire Lumens: 3343.9 lumens  
Efficiency: N/A  
Efficacy: 103.5 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 2.07' x L: 2.07' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 32.3  
Input Voltage (V): 120  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9967  
Total Harmonic Distortion (THDi): 0.063  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

TEST NUMBER: P921234

CATALOG NUMBER: DFN2DIP-4P2F0-020D020US940-FLLFLL

### Luminous Intensity Polar Plot



TEST NUMBER: P921234

CATALOG NUMBER: DFN2DIP-4P2F0-020D020US940-FLLFLL

**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   | 108 | 108 | 108 | 108 | 100 | 100 | 100 | 100 | 85 | 85 | 85 | 71 | 71 | 71 | 59 | 59 | 59 |
| 1   | 98  | 94  | 90  | 87  | 91  | 87  | 84  | 81  | 74 | 72 | 70 | 63 | 61 | 59 | 52 | 51 | 50 |
| 2   | 90  | 82  | 76  | 71  | 83  | 76  | 71  | 66  | 65 | 61 | 58 | 55 | 52 | 50 | 46 | 44 | 42 |
| 3   | 82  | 72  | 65  | 59  | 75  | 67  | 61  | 55  | 58 | 53 | 49 | 49 | 45 | 42 | 41 | 38 | 36 |
| 4   | 75  | 64  | 56  | 50  | 69  | 60  | 52  | 47  | 51 | 46 | 41 | 43 | 39 | 36 | 36 | 33 | 31 |
| 5   | 69  | 57  | 49  | 43  | 63  | 53  | 46  | 40  | 46 | 40 | 36 | 39 | 35 | 31 | 33 | 29 | 27 |
| 6   | 63  | 51  | 43  | 37  | 58  | 48  | 40  | 35  | 41 | 36 | 31 | 35 | 31 | 27 | 30 | 26 | 24 |
| 7   | 59  | 46  | 38  | 33  | 54  | 43  | 36  | 31  | 37 | 32 | 28 | 32 | 28 | 24 | 27 | 24 | 21 |
| 8   | 54  | 42  | 34  | 29  | 50  | 39  | 32  | 27  | 34 | 29 | 24 | 29 | 25 | 22 | 25 | 21 | 19 |
| 9   | 51  | 38  | 31  | 26  | 47  | 36  | 29  | 24  | 31 | 26 | 22 | 27 | 23 | 19 | 23 | 20 | 17 |
| 10  | 47  | 35  | 28  | 23  | 44  | 33  | 26  | 22  | 29 | 23 | 20 | 25 | 21 | 18 | 21 | 18 | 15 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1738 | 1738 | 1738 |
| 5°  | 1737 | 1709 | 1722 |
| 10° | 1719 | 1682 | 1696 |
| 15° | 1691 | 1649 | 1657 |
| 20° | 1653 | 1607 | 1616 |
| 25° | 1616 | 1556 | 1570 |
| 30° | 1569 | 1509 | 1513 |
| 35° | 1525 | 1454 | 1452 |
| 40° | 1472 | 1399 | 1394 |
| 45° | 1418 | 1343 | 1334 |
| 50° | 1359 | 1284 | 1266 |
| 55° | 1297 | 1216 | 1202 |
| 60° | 1228 | 1136 | 1129 |
| 65° | 1150 | 1052 | 1043 |
| 70° | 1052 | 950  | 950  |
| 75° | 919  | 828  | 859  |
| 80° | 756  | 673  | 694  |
| 85° | 506  | 420  | 433  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 1418 cd/sqm

TEST NUMBER: P921234

CATALOG NUMBER: DFN2DIP-4P2F0-020D020US940-FLLFLL

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 65.3   | 2.0       |
| 10°-20°   | 183.8  | 5.5       |
| 20°-30°   | 270.1  | 8.1       |
| 30°-40°   | 313.7  | 9.4       |
| 40°-50°   | 313.3  | 9.4       |
| 50°-60°   | 273.2  | 8.2       |
| 60°-70°   | 201.9  | 6.0       |
| 70°-80°   | 114.2  | 3.4       |
| 80°-90°   | 31.8   | 1.0       |
| 90°-100°  | 34.9   | 1.0       |
| 100°-110° | 110.9  | 3.3       |
| 110°-120° | 189.8  | 5.7       |
| 120°-130° | 249.6  | 7.5       |
| 130°-140° | 280.2  | 8.4       |
| 140°-150° | 274.7  | 8.2       |
| 150°-160° | 230.4  | 6.9       |
| 160°-170° | 152.8  | 4.6       |
| 170°-180° | 53.4   | 1.6       |
| 0°-30°    | 519.1  | 15.5      |
| 0°-40°    | 832.8  | 24.9      |
| 0°-60°    | 1419.3 | 42.4      |
| 0°-90°    | 1767.2 | 52.8      |
| 90°-120°  | 335.6  | 10.0      |
| 90°-150°  | 1140.0 | 34.1      |
| 90°-180°  | 1577.0 | 47.2      |
| 0°-180°   | 3343.9 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°  | 22.5° | 45° | 67.5° | 90° | Flux |
|------|-----|-------|-----|-------|-----|------|
| 0°   | 694 | 694   | 694 | 694   | 694 |      |
| 5°   | 694 | 691   | 684 | 689   | 688 | 66   |
| 15°  | 661 | 657   | 648 | 651   | 647 | 186  |
| 25°  | 598 | 592   | 581 | 582   | 581 | 275  |
| 35°  | 516 | 509   | 498 | 494   | 491 | 322  |
| 45°  | 420 | 415   | 405 | 398   | 395 | 324  |
| 55°  | 318 | 314   | 306 | 298   | 294 | 284  |
| 65°  | 214 | 210   | 204 | 198   | 194 | 212  |
| 75°  | 112 | 111   | 107 | 103   | 105 | 120  |
| 85°  | 27  | 27    | 26  | 24    | 23  | 30   |
| 90°  | 0   | 6     | 17  | 16    | 16  | 3    |
| 95°  | 25  | 30    | 30  | 30    | 30  | 28   |
| 105° | 102 | 104   | 105 | 106   | 106 | 108  |
| 115° | 190 | 193   | 192 | 192   | 190 | 188  |
| 125° | 277 | 281   | 280 | 278   | 278 | 248  |
| 135° | 358 | 364   | 364 | 364   | 363 | 277  |
| 145° | 435 | 438   | 441 | 442   | 440 | 272  |
| 155° | 497 | 499   | 500 | 503   | 501 | 229  |
| 165° | 541 | 541   | 541 | 544   | 542 | 153  |
| 175° | 563 | 562   | 561 | 564   | 561 | 53   |
| 180° | 564 | 564   | 564 | 564   | 564 |      |

TEST NUMBER: P921234

CATALOG NUMBER: DFN2DIP-4P2F0-020D020US940-FLLFLL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°    | 22.5° | 45°   | 67.5° | 90°   |
|--------|-------|-------|-------|-------|-------|
| 0°     | 693.9 | 693.9 | 693.9 | 693.9 | 693.9 |
| 2.5°   | 697.9 | 694.6 | 687.2 | 693.9 | 692.7 |
| 5°     | 693.9 | 691.3 | 683.9 | 689.3 | 688.0 |
| 7.5°   | 689.3 | 685.3 | 678.0 | 683.3 | 682.0 |
| 10°    | 682.0 | 677.3 | 669.3 | 674.6 | 672.6 |
| 12.5°  | 671.9 | 668.0 | 660.0 | 663.3 | 661.9 |
| 15°    | 660.6 | 656.7 | 647.9 | 650.6 | 647.3 |
| 17.5°  | 646.6 | 642.7 | 633.9 | 637.2 | 633.9 |
| 20°    | 631.2 | 627.2 | 617.9 | 619.9 | 617.2 |
| 22.5°  | 615.9 | 609.9 | 601.2 | 601.2 | 599.9 |
| 25°    | 597.9 | 592.5 | 581.2 | 582.5 | 581.2 |
| 27.5°  | 577.8 | 573.2 | 564.5 | 562.6 | 559.2 |
| 30°    | 557.9 | 552.5 | 542.5 | 540.6 | 537.8 |
| 32.5°  | 536.5 | 532.5 | 521.8 | 517.8 | 515.1 |
| 35°    | 515.9 | 509.2 | 498.5 | 494.5 | 491.1 |
| 37.5°  | 492.5 | 486.4 | 475.7 | 471.1 | 467.7 |
| 40°    | 468.4 | 463.1 | 452.4 | 446.5 | 443.7 |
| 42.5°  | 445.1 | 439.7 | 429.1 | 422.4 | 418.4 |
| 45°    | 419.7 | 415.1 | 405.0 | 397.7 | 395.0 |
| 47.5°  | 395.0 | 390.4 | 379.7 | 372.3 | 368.4 |
| 50°    | 369.0 | 365.7 | 356.3 | 347.0 | 343.7 |
| 52.5°  | 343.7 | 338.9 | 330.3 | 323.0 | 318.3 |
| 55°    | 317.6 | 313.6 | 305.6 | 297.7 | 294.3 |
| 57.5°  | 291.6 | 288.3 | 279.6 | 271.6 | 268.9 |
| 60°    | 265.6 | 263.0 | 253.6 | 246.2 | 244.2 |
| 62.5°  | 240.2 | 235.5 | 228.9 | 222.2 | 219.5 |
| 65°    | 214.2 | 210.2 | 203.6 | 197.5 | 194.2 |
| 67.5°  | 187.5 | 184.1 | 178.2 | 173.5 | 170.9 |
| 70°    | 162.8 | 160.2 | 154.1 | 149.5 | 146.9 |
| 72.5°  | 137.5 | 134.8 | 131.4 | 126.8 | 124.8 |
| 75°    | 112.1 | 110.8 | 107.4 | 103.4 | 104.8 |
| 77.5°  | 89.4  | 86.8  | 85.3  | 83.4  | 81.4  |
| 80°    | 66.8  | 66.1  | 64.7  | 62.7  | 61.3  |
| 82.5°  | 45.4  | 45.4  | 44.8  | 42.1  | 42.1  |
| 85°    | 27.3  | 26.7  | 26.0  | 24.0  | 23.4  |
| 87.5°  | 12.0  | 10.7  | 9.4   | 7.4   | 6.7   |
| 90°    | 0.5   | 6.2   | 16.7  | 15.6  | 16.1  |
| 92.5°  | 10.5  | 14.3  | 14.8  | 15.3  | 15.3  |
| 95°    | 24.8  | 29.6  | 30.4  | 30.4  | 29.6  |
| 97.5°  | 41.3  | 45.7  | 47.6  | 47.6  | 47.6  |
| 100°   | 60.4  | 64.3  | 65.6  | 65.6  | 65.1  |
| 102.5° | 80.4  | 83.3  | 85.2  | 85.7  | 85.2  |
| 105°   | 102.4 | 103.7 | 104.8 | 105.6 | 105.6 |
| 107.5° | 124.1 | 126.2 | 126.2 | 126.5 | 124.1 |
| 110°   | 145.3 | 147.9 | 147.9 | 147.9 | 146.6 |

TEST NUMBER: P921234

CATALOG NUMBER: DFN2DIP-4P2F0-020D020US940-FLLFLL

**CANDELA DISTRIBUTION (continued):**

|        | 0°    | 22.5° | 45°   | 67.5° | 90°   |
|--------|-------|-------|-------|-------|-------|
| 112.5° | 168.0 | 170.9 | 170.4 | 169.0 | 168.0 |
| 115°   | 190.5 | 193.1 | 192.3 | 191.8 | 190.5 |
| 117.5° | 212.8 | 216.5 | 214.1 | 212.8 | 211.3 |
| 120°   | 235.1 | 238.9 | 235.1 | 235.1 | 233.6 |
| 122.5° | 255.6 | 260.3 | 258.0 | 256.6 | 255.6 |
| 125°   | 277.0 | 281.2 | 279.9 | 278.4 | 277.9 |
| 127.5° | 297.9 | 303.2 | 301.3 | 299.3 | 297.9 |
| 130°   | 317.4 | 323.6 | 322.7 | 321.7 | 319.9 |
| 132.5° | 339.4 | 344.2 | 344.5 | 342.1 | 340.7 |
| 135°   | 358.3 | 363.6 | 364.5 | 364.1 | 362.7 |
| 137.5° | 379.3 | 383.6 | 384.5 | 384.1 | 382.1 |
| 140°   | 397.9 | 402.2 | 404.6 | 404.6 | 402.7 |
| 142.5° | 417.0 | 421.2 | 422.6 | 423.0 | 421.2 |
| 145°   | 435.0 | 438.4 | 441.1 | 441.6 | 439.7 |
| 147.5° | 451.1 | 455.4 | 457.4 | 458.2 | 456.4 |
| 150°   | 467.8 | 470.6 | 472.5 | 474.0 | 472.5 |
| 152.5° | 482.6 | 485.4 | 487.9 | 489.7 | 487.9 |
| 155°   | 497.4 | 498.7 | 500.2 | 502.7 | 501.1 |
| 157.5° | 510.1 | 511.1 | 512.0 | 515.4 | 513.0 |
| 160°   | 521.6 | 522.5 | 523.1 | 525.9 | 523.9 |
| 162.5° | 532.1 | 532.1 | 532.5 | 535.8 | 533.4 |
| 165°   | 541.1 | 540.6 | 540.6 | 543.9 | 541.6 |
| 167.5° | 549.2 | 547.7 | 547.7 | 551.1 | 548.8 |
| 170°   | 555.4 | 554.0 | 553.5 | 556.9 | 554.0 |
| 172.5° | 559.6 | 558.2 | 557.8 | 561.2 | 558.2 |
| 175°   | 563.0 | 561.7 | 560.6 | 564.0 | 561.2 |
| 177.5° | 564.9 | 563.6 | 562.5 | 565.3 | 562.5 |
| 180°   | 564.0 | 564.0 | 564.0 | 564.0 | 564.0 |

TEST NUMBER: P921234

CATALOG NUMBER: DFN2DIP-4P2F0-020D020US940-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 | 9.32             | 10.20 | 10.25 | 11.15 | 12.38 | 8.87           | 9.76  | 9.80  | 10.71 | 11.94 |
|                 | 3H   | 10.96            | 11.75 | 11.90 | 12.71 | 13.96 | 10.47          | 11.26 | 11.41 | 12.22 | 13.47 |
|                 | 4H   | 11.53            | 12.28 | 12.49 | 13.25 | 14.51 | 11.04          | 11.79 | 11.99 | 12.75 | 14.01 |
|                 | 6H   | 11.91            | 12.61 | 12.88 | 13.58 | 14.85 | 11.41          | 12.11 | 12.38 | 13.08 | 14.35 |
|                 | 8H   | 12.01            | 12.67 | 12.99 | 13.66 | 14.93 | 11.51          | 12.17 | 12.48 | 13.16 | 14.43 |
|                 | 12H  | 12.05            | 12.68 | 13.03 | 13.66 | 14.96 | 11.54          | 12.17 | 12.52 | 13.15 | 14.45 |
| 4H              | 2H   | 9.77             | 10.52 | 10.73 | 11.49 | 12.75 | 9.41           | 10.17 | 10.38 | 11.13 | 12.39 |
|                 | 3H   | 11.61            | 12.24 | 12.58 | 13.23 | 14.51 | 11.20          | 11.83 | 12.17 | 12.82 | 14.10 |
|                 | 4H   | 12.31            | 12.88 | 13.29 | 13.87 | 15.17 | 11.88          | 12.46 | 12.86 | 13.44 | 14.74 |
|                 | 6H   | 12.80            | 13.30 | 13.80 | 14.31 | 15.61 | 12.37          | 12.86 | 13.36 | 13.87 | 15.17 |
|                 | 8H   | 12.94            | 13.40 | 13.94 | 14.41 | 15.72 | 12.50          | 12.97 | 13.50 | 13.97 | 15.28 |
|                 | 12H  | 13.00            | 13.42 | 14.02 | 14.44 | 15.76 | 12.56          | 12.97 | 13.57 | 13.99 | 15.31 |
| 8H              | 4H   | 12.49            | 12.95 | 13.49 | 13.96 | 15.27 | 12.11          | 12.58 | 13.11 | 13.58 | 14.89 |
|                 | 6H   | 13.10            | 13.48 | 14.12 | 14.52 | 15.84 | 12.71          | 13.09 | 13.73 | 14.14 | 15.45 |
|                 | 8H   | 13.30            | 13.64 | 14.33 | 14.67 | 16.00 | 12.91          | 13.25 | 13.94 | 14.28 | 15.61 |
|                 | 12H  | 13.42            | 13.72 | 14.45 | 14.74 | 16.12 | 13.01          | 13.31 | 14.04 | 14.33 | 15.71 |
| 12H             | 4H   | 12.48            | 12.89 | 13.49 | 13.91 | 15.23 | 12.11          | 12.52 | 13.12 | 13.54 | 14.86 |
|                 | 6H   | 13.12            | 13.46 | 14.15 | 14.49 | 15.82 | 12.75          | 13.08 | 13.78 | 14.12 | 15.45 |
|                 | 8H   | 13.35            | 13.64 | 14.38 | 14.67 | 16.04 | 12.96          | 13.26 | 14.00 | 14.29 | 15.66 |