

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: P913052

Luminaire Tested: DFN2DIP-4P2F0-020D020US927-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P913052  
REPORT IS A COMBINATION OF REPORTS P899012 AND P895899  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-4P2F0-020D020US927-RLLFLL  
Description: 2 foot, 90deg - 4way Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

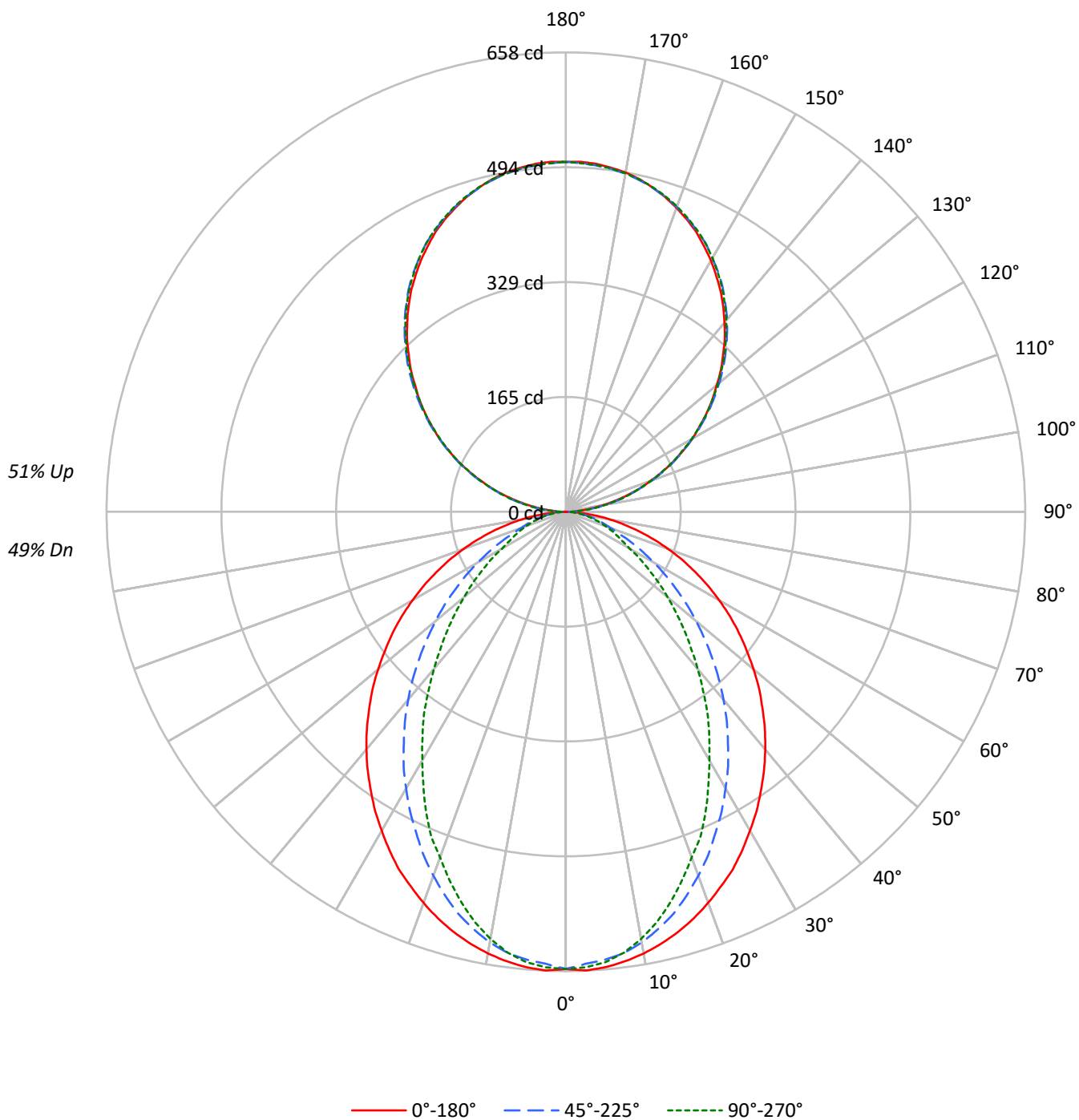
Lumens per Lamp: N/A  
Luminaire Lumens: 2748.9 lumens  
Efficiency: N/A  
Efficacy: 85.1 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 2.07' x L: 2.07' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 32.3  
Input Voltage (V):  
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

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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 | 68 | 68 | 68 | 55 | 55 | 55 |
| 1   | 98  | 94  | 90  | 87  | 90 | 87 | 84 | 81 | 73 | 71 | 69 | 61 | 59 | 58 | 50 | 49 | 48 |
| 2   | 90  | 83  | 77  | 72  | 82 | 76 | 71 | 67 | 65 | 61 | 58 | 54 | 51 | 49 | 44 | 42 | 41 |
| 3   | 82  | 73  | 66  | 60  | 75 | 68 | 61 | 57 | 58 | 53 | 49 | 48 | 45 | 42 | 40 | 37 | 35 |
| 4   | 75  | 65  | 57  | 51  | 69 | 60 | 54 | 48 | 51 | 46 | 42 | 43 | 40 | 36 | 36 | 33 | 31 |
| 5   | 69  | 58  | 50  | 44  | 64 | 54 | 47 | 42 | 46 | 41 | 37 | 39 | 35 | 32 | 32 | 29 | 27 |
| 6   | 64  | 52  | 44  | 39  | 59 | 49 | 42 | 37 | 42 | 36 | 32 | 35 | 31 | 28 | 30 | 26 | 24 |
| 7   | 59  | 47  | 40  | 34  | 55 | 44 | 37 | 32 | 38 | 33 | 29 | 32 | 28 | 25 | 27 | 24 | 22 |
| 8   | 55  | 43  | 36  | 30  | 51 | 40 | 33 | 29 | 35 | 29 | 26 | 30 | 26 | 23 | 25 | 22 | 20 |
| 9   | 51  | 39  | 32  | 27  | 47 | 37 | 30 | 26 | 32 | 27 | 23 | 27 | 23 | 20 | 23 | 20 | 18 |
| 10  | 48  | 36  | 29  | 24  | 44 | 34 | 28 | 23 | 30 | 24 | 21 | 25 | 21 | 19 | 22 | 18 | 16 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1640 | 1640 | 1640 |
| 5°  | 1639 | 1609 | 1621 |
| 10° | 1620 | 1574 | 1566 |
| 15° | 1594 | 1518 | 1482 |
| 20° | 1561 | 1442 | 1380 |
| 25° | 1528 | 1358 | 1281 |
| 30° | 1484 | 1273 | 1157 |
| 35° | 1440 | 1181 | 1048 |
| 40° | 1396 | 1086 | 923  |
| 45° | 1345 | 983  | 811  |
| 50° | 1293 | 878  | 701  |
| 55° | 1237 | 766  | 595  |
| 60° | 1173 | 650  | 488  |
| 65° | 1098 | 533  | 436  |
| 70° | 1007 | 424  | 390  |
| 75° | 894  | 366  | 350  |
| 80° | 731  | 295  | 296  |
| 85° | 470  | 181  | 207  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 1345 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 61.4   | 2.2       |
| 10°-20°   | 168.5  | 6.1       |
| 20°-30°   | 236.5  | 8.6       |
| 30°-40°   | 257.8  | 9.4       |
| 40°-50°   | 237.0  | 8.6       |
| 50°-60°   | 186.1  | 6.8       |
| 60°-70°   | 121.2  | 4.4       |
| 70°-80°   | 62.3   | 2.3       |
| 80°-90°   | 17.3   | 0.6       |
| 90°-100°  | 31.0   | 1.1       |
| 100°-110° | 98.5   | 3.6       |
| 110°-120° | 168.6  | 6.1       |
| 120°-130° | 221.7  | 8.1       |
| 130°-140° | 248.9  | 9.1       |
| 140°-150° | 244.1  | 8.9       |
| 150°-160° | 204.7  | 7.4       |
| 160°-170° | 135.8  | 4.9       |
| 170°-180° | 47.5   | 1.7       |
| <hr/>     |        |           |
| 0°-30°    | 466.4  | 17.0      |
| 0°-40°    | 724.2  | 26.3      |
| 0°-60°    | 1147.3 | 41.7      |
| 0°-90°    | 1348.1 | 49.0      |
| 90°-120°  | 298.1  | 10.8      |
| 90°-150°  | 1012.8 | 36.8      |
| 90°-180°  | 1401.0 | 51.0      |
| 0°-180°   | 2748.9 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°  | 22.5° | 45° | 67.5° | 90° | Flux |
|------|-----|-------|-----|-------|-----|------|
| 0°   | 655 | 655   | 655 | 655   | 655 |      |
| 5°   | 655 | 652   | 644 | 650   | 648 | 62   |
| 15°  | 623 | 616   | 596 | 585   | 579 | 176  |
| 25°  | 565 | 546   | 507 | 483   | 474 | 260  |
| 35°  | 487 | 457   | 405 | 367   | 354 | 305  |
| 45°  | 398 | 358   | 296 | 254   | 240 | 308  |
| 55°  | 303 | 257   | 193 | 157   | 146 | 271  |
| 65°  | 204 | 156   | 103 | 83    | 81  | 203  |
| 75°  | 109 | 68    | 47  | 43    | 43  | 115  |
| 85°  | 25  | 13    | 11  | 11    | 11  | 29   |
| 90°  | 0   | 6     | 15  | 14    | 14  | 3    |
| 95°  | 22  | 26    | 27  | 27    | 26  | 25   |
| 105° | 91  | 92    | 93  | 94    | 94  | 96   |
| 115° | 169 | 172   | 171 | 170   | 169 | 167  |
| 125° | 246 | 250   | 249 | 247   | 247 | 220  |
| 135° | 318 | 323   | 324 | 323   | 322 | 246  |
| 145° | 386 | 389   | 392 | 392   | 391 | 241  |
| 155° | 442 | 443   | 444 | 447   | 445 | 203  |
| 165° | 481 | 480   | 480 | 483   | 481 | 136  |
| 175° | 500 | 499   | 498 | 501   | 498 | 48   |
| 180° | 501 | 501   | 501 | 501   | 501 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°    | 22.5° | 45°   | 67.5° | 90°   |
|--------|-------|-------|-------|-------|-------|
| 0°     | 654.8 | 654.8 | 654.8 | 654.8 | 654.8 |
| 2.5°   | 657.7 | 654.8 | 648.2 | 654.3 | 653.1 |
| 5°     | 654.8 | 651.9 | 644.1 | 649.5 | 647.7 |
| 7.5°   | 649.5 | 645.9 | 637.6 | 640.0 | 637.0 |
| 10°    | 642.4 | 638.2 | 626.4 | 624.6 | 621.1 |
| 12.5°  | 633.5 | 628.1 | 612.1 | 608.6 | 602.1 |
| 15°    | 622.8 | 616.2 | 596.1 | 584.9 | 579.0 |
| 17.5°  | 610.4 | 600.9 | 576.0 | 562.9 | 553.5 |
| 20°    | 596.1 | 584.2 | 554.7 | 539.9 | 526.8 |
| 22.5°  | 580.7 | 567.1 | 532.7 | 512.6 | 503.7 |
| 25°    | 565.4 | 546.4 | 507.2 | 483.0 | 474.0 |
| 27.5°  | 547.0 | 526.8 | 483.5 | 455.7 | 442.0 |
| 30°    | 527.4 | 504.9 | 457.5 | 427.3 | 411.2 |
| 32.5°  | 508.4 | 481.2 | 432.6 | 397.0 | 382.2 |
| 35°    | 487.1 | 456.9 | 404.8 | 367.4 | 354.3 |
| 37.5°  | 466.4 | 433.7 | 378.7 | 337.8 | 323.0 |
| 40°    | 444.4 | 408.9 | 351.4 | 309.3 | 293.9 |
| 42.5°  | 421.9 | 384.0 | 324.2 | 280.3 | 265.5 |
| 45°    | 398.2 | 358.5 | 296.4 | 254.2 | 240.0 |
| 47.5°  | 375.7 | 333.7 | 269.7 | 227.5 | 214.5 |
| 50°    | 350.9 | 308.8 | 243.6 | 202.6 | 190.3 |
| 52.5°  | 326.5 | 282.0 | 218.6 | 179.6 | 168.3 |
| 55°    | 302.8 | 256.6 | 192.6 | 157.1 | 145.8 |
| 57.5°  | 278.5 | 231.1 | 169.5 | 136.3 | 126.8 |
| 60°    | 253.7 | 206.2 | 145.2 | 115.0 | 105.5 |
| 62.5°  | 229.3 | 182.0 | 124.5 | 96.0  | 91.3  |
| 65°    | 204.5 | 156.5 | 103.1 | 83.0  | 81.2  |
| 67.5°  | 180.8 | 132.7 | 83.0  | 72.9  | 71.1  |
| 70°    | 155.8 | 109.6 | 68.7  | 62.8  | 60.4  |
| 72.5°  | 132.1 | 88.2  | 57.4  | 52.8  | 51.6  |
| 75°    | 109.0 | 67.5  | 47.4  | 43.3  | 42.7  |
| 77.5°  | 86.0  | 48.0  | 37.3  | 34.9  | 33.7  |
| 80°    | 64.6  | 34.4  | 28.4  | 26.1  | 26.1  |
| 82.5°  | 45.0  | 23.1  | 19.6  | 18.4  | 18.4  |
| 85°    | 25.4  | 13.0  | 11.2  | 11.2  | 11.2  |
| 87.5°  | 9.5   | 4.8   | 4.8   | 4.1   | 4.1   |
| 90°    | 0.5   | 5.5   | 14.8  | 13.9  | 14.3  |
| 92.5°  | 9.3   | 12.7  | 13.2  | 13.6  | 13.6  |
| 95°    | 22.0  | 26.3  | 27.0  | 27.0  | 26.3  |
| 97.5°  | 36.7  | 40.6  | 42.3  | 42.3  | 42.3  |
| 100°   | 53.6  | 57.1  | 58.3  | 58.3  | 57.8  |
| 102.5° | 71.5  | 74.0  | 75.7  | 76.1  | 75.7  |
| 105°   | 90.9  | 92.1  | 93.1  | 93.8  | 93.8  |
| 107.5° | 110.3 | 112.1 | 112.1 | 112.4 | 110.3 |
| 110°   | 129.0 | 131.4 | 131.4 | 131.4 | 130.2 |



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**CANDELA DISTRIBUTION (continued):**

|        | 0°    | 22.5° | 45°   | 67.5° | 90°   |
|--------|-------|-------|-------|-------|-------|
| 112.5° | 149.2 | 151.8 | 151.4 | 150.1 | 149.2 |
| 115°   | 169.2 | 171.6 | 170.9 | 170.4 | 169.2 |
| 117.5° | 189.0 | 192.3 | 190.2 | 189.0 | 187.7 |
| 120°   | 208.9 | 212.2 | 208.9 | 208.9 | 207.6 |
| 122.5° | 227.0 | 231.2 | 229.2 | 228.0 | 227.0 |
| 125°   | 246.1 | 249.9 | 248.7 | 247.3 | 246.8 |
| 127.5° | 264.7 | 269.3 | 267.7 | 265.9 | 264.7 |
| 130°   | 282.0 | 287.5 | 286.7 | 285.8 | 284.2 |
| 132.5° | 301.5 | 305.8 | 306.0 | 304.0 | 302.7 |
| 135°   | 318.3 | 323.0 | 323.8 | 323.4 | 322.2 |
| 137.5° | 337.0 | 340.8 | 341.6 | 341.3 | 339.4 |
| 140°   | 353.5 | 357.3 | 359.4 | 359.4 | 357.7 |
| 142.5° | 370.4 | 374.1 | 375.4 | 375.8 | 374.1 |
| 145°   | 386.4 | 389.4 | 391.9 | 392.3 | 390.6 |
| 147.5° | 400.8 | 404.6 | 406.4 | 407.1 | 405.4 |
| 150°   | 415.6 | 418.1 | 419.8 | 421.1 | 419.8 |
| 152.5° | 428.7 | 431.3 | 433.4 | 435.1 | 433.4 |
| 155°   | 441.9 | 443.1 | 444.4 | 446.6 | 445.2 |
| 157.5° | 453.2 | 454.1 | 454.9 | 457.9 | 455.7 |
| 160°   | 463.3 | 464.2 | 464.7 | 467.2 | 465.4 |
| 162.5° | 472.7 | 472.7 | 473.1 | 476.0 | 473.9 |
| 165°   | 480.7 | 480.2 | 480.2 | 483.2 | 481.2 |
| 167.5° | 487.9 | 486.6 | 486.6 | 489.6 | 487.5 |
| 170°   | 493.4 | 492.2 | 491.7 | 494.7 | 492.2 |
| 172.5° | 497.2 | 495.9 | 495.5 | 498.5 | 495.9 |
| 175°   | 500.2 | 499.0 | 498.0 | 501.1 | 498.5 |
| 177.5° | 501.8 | 500.7 | 499.7 | 502.2 | 499.7 |
| 180°   | 501.1 | 501.1 | 501.1 | 501.1 | 501.1 |

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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 | 8.64             | 9.46  | 9.61  | 10.44 | 11.73 | 4.60           | 5.42 | 5.57 | 6.40 | 7.69  |
|                 | 3H   | 10.29            | 11.03 | 11.28 | 12.02 | 13.33 | 5.77           | 6.50 | 6.75 | 7.49 | 8.80  |
|                 | 4H   | 10.88            | 11.58 | 11.88 | 12.57 | 13.89 | 6.20           | 6.90 | 7.20 | 7.89 | 9.21  |
|                 | 6H   | 11.29            | 11.93 | 12.29 | 12.93 | 14.26 | 6.50           | 7.14 | 7.51 | 8.14 | 9.47  |
|                 | 8H   | 11.40            | 12.01 | 12.42 | 13.03 | 14.35 | 6.58           | 7.19 | 7.60 | 8.21 | 9.54  |
|                 | 12H  | 11.46            | 12.03 | 12.47 | 13.04 | 14.39 | 6.62           | 7.20 | 7.64 | 8.21 | 9.56  |
| 4H              | 2H   | 8.65             | 9.35  | 9.65  | 10.34 | 11.66 | 5.18           | 5.88 | 6.18 | 6.87 | 8.19  |
|                 | 3H   | 10.45            | 11.03 | 11.46 | 12.05 | 13.38 | 6.51           | 7.08 | 7.52 | 8.11 | 9.44  |
|                 | 4H   | 11.13            | 11.65 | 12.14 | 12.67 | 14.02 | 7.04           | 7.57 | 8.06 | 8.58 | 9.94  |
|                 | 6H   | 11.62            | 12.07 | 12.65 | 13.11 | 14.46 | 7.43           | 7.89 | 8.46 | 8.93 | 10.28 |
|                 | 8H   | 11.78            | 12.20 | 12.81 | 13.24 | 14.60 | 7.55           | 7.97 | 8.58 | 9.01 | 10.37 |
|                 | 12H  | 11.86            | 12.24 | 12.91 | 13.29 | 14.66 | 7.60           | 7.98 | 8.65 | 9.03 | 10.40 |
| 8H              | 4H   | 11.09            | 11.51 | 12.12 | 12.54 | 13.91 | 7.30           | 7.73 | 8.33 | 8.76 | 10.12 |
|                 | 6H   | 11.63            | 11.98 | 12.68 | 13.05 | 14.42 | 7.79           | 8.14 | 8.85 | 9.22 | 10.58 |
|                 | 8H   | 11.83            | 12.14 | 12.89 | 13.20 | 14.58 | 7.97           | 8.27 | 9.03 | 9.33 | 10.72 |
|                 | 12H  | 11.95            | 12.22 | 13.02 | 13.28 | 14.70 | 8.07           | 8.34 | 9.13 | 9.39 | 10.82 |
| 12H             | 4H   | 11.04            | 11.42 | 12.09 | 12.47 | 13.84 | 7.30           | 7.69 | 8.35 | 8.73 | 10.10 |
|                 | 6H   | 11.60            | 11.91 | 12.66 | 12.97 | 14.35 | 7.83           | 8.14 | 8.90 | 9.20 | 10.58 |
|                 | 8H   | 11.81            | 12.08 | 12.87 | 13.13 | 14.55 | 8.03           | 8.30 | 9.09 | 9.35 | 10.78 |