

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: P904942

Luminaire Tested: DFN2DIP-4P3F0-040D020US835-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P904942  
REPORT IS A COMBINATION OF REPORTS P899033 AND P895917  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-4P3F0-040D020US835-FLLFLL  
Description: 3 foot, 90deg - 4way Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

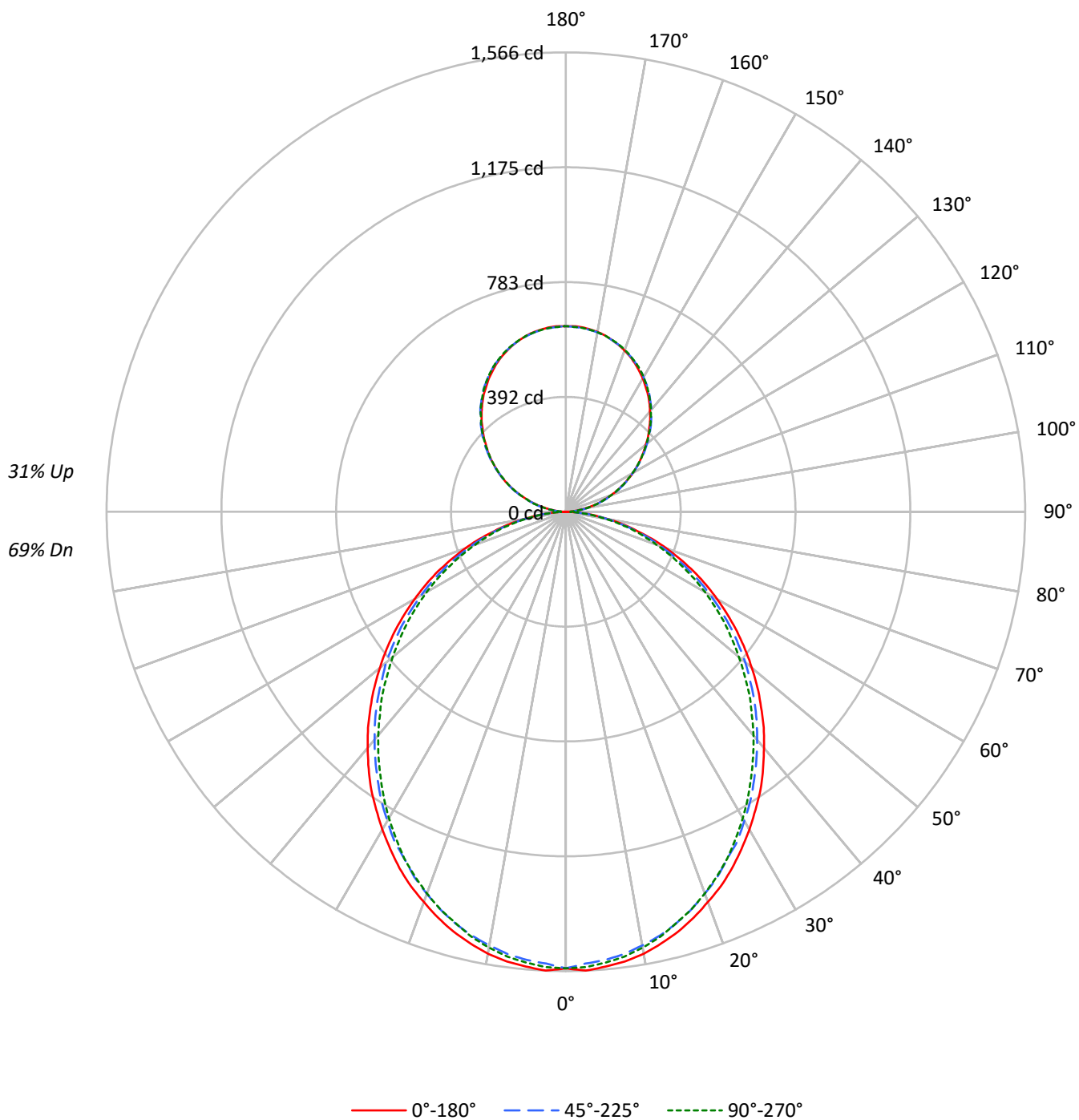
Lumens per Lamp: N/A  
Luminaire Lumens: 5730.0 lumens  
Efficiency: N/A  
Efficacy: 108.1 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.07' x L: 3.07' x H: 0.1')  
CIE Type: Semi-Direct

Input Watts (W): 53  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9789  
Total Harmonic Distortion (THDi): 0.074  
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   | 112 | 112 | 112 | 112 | 106 | 106 | 106 | 106 | 94 | 94 | 94 | 83 | 83 | 83 | 74 | 74 | 74 |
| 1   | 102 | 98  | 94  | 90  | 96  | 92  | 89  | 86  | 83 | 80 | 77 | 74 | 71 | 70 | 65 | 64 | 62 |
| 2   | 93  | 85  | 79  | 74  | 88  | 81  | 75  | 70  | 72 | 68 | 64 | 65 | 61 | 58 | 57 | 55 | 52 |
| 3   | 85  | 75  | 67  | 61  | 80  | 71  | 64  | 59  | 64 | 58 | 54 | 57 | 53 | 49 | 51 | 48 | 45 |
| 4   | 78  | 67  | 58  | 52  | 73  | 63  | 56  | 50  | 57 | 51 | 46 | 51 | 46 | 42 | 46 | 42 | 39 |
| 5   | 71  | 59  | 51  | 45  | 67  | 56  | 49  | 43  | 51 | 45 | 40 | 46 | 41 | 37 | 41 | 37 | 34 |
| 6   | 66  | 53  | 45  | 39  | 62  | 51  | 43  | 38  | 46 | 40 | 35 | 41 | 36 | 32 | 37 | 33 | 30 |
| 7   | 61  | 48  | 40  | 34  | 58  | 46  | 39  | 33  | 42 | 35 | 31 | 38 | 33 | 29 | 34 | 30 | 26 |
| 8   | 57  | 44  | 36  | 31  | 54  | 42  | 35  | 30  | 38 | 32 | 28 | 35 | 29 | 26 | 31 | 27 | 24 |
| 9   | 53  | 40  | 33  | 27  | 50  | 39  | 31  | 26  | 35 | 29 | 25 | 32 | 27 | 23 | 29 | 25 | 21 |
| 10  | 50  | 37  | 30  | 25  | 47  | 36  | 29  | 24  | 32 | 27 | 22 | 30 | 25 | 21 | 27 | 23 | 20 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1774 | 1774 | 1774 |
| 5°  | 1775 | 1748 | 1760 |
| 10° | 1760 | 1723 | 1736 |
| 15° | 1733 | 1694 | 1698 |
| 20° | 1697 | 1653 | 1659 |
| 25° | 1661 | 1605 | 1615 |
| 30° | 1616 | 1560 | 1558 |
| 35° | 1574 | 1507 | 1498 |
| 40° | 1522 | 1453 | 1441 |
| 45° | 1469 | 1400 | 1383 |
| 50° | 1412 | 1343 | 1315 |
| 55° | 1353 | 1278 | 1253 |
| 60° | 1285 | 1201 | 1182 |
| 65° | 1211 | 1120 | 1098 |
| 70° | 1117 | 1023 | 1007 |
| 75° | 987  | 905  | 923  |
| 80° | 829  | 755  | 763  |
| 85° | 584  | 500  | 499  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 1469 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 146.5  | 2.6       |
| 10°-20°   | 412.2  | 7.2       |
| 20°-30°   | 605.7  | 10.6      |
| 30°-40°   | 703.5  | 12.3      |
| 40°-50°   | 702.6  | 12.3      |
| 50°-60°   | 612.7  | 10.7      |
| 60°-70°   | 452.9  | 7.9       |
| 70°-80°   | 256.2  | 4.5       |
| 80°-90°   | 69.4   | 1.2       |
| 90°-100°  | 39.1   | 0.7       |
| 100°-110° | 124.4  | 2.2       |
| 110°-120° | 212.8  | 3.7       |
| 120°-130° | 279.9  | 4.9       |
| 130°-140° | 314.2  | 5.5       |
| 140°-150° | 308.1  | 5.4       |
| 150°-160° | 258.4  | 4.5       |
| 160°-170° | 171.4  | 3.0       |
| 170°-180° | 59.9   | 1.0       |
| 0°-30°    | 1164.4 | 20.3      |
| 0°-40°    | 1867.9 | 32.6      |
| 0°-60°    | 3183.2 | 55.6      |
| 0°-90°    | 3961.8 | 69.1      |
| 90°-120°  | 376.3  | 6.6       |
| 90°-150°  | 1278.5 | 22.3      |
| 90°-180°  | 1768.0 | 30.9      |
| 0°-180°   | 5730.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1556 | 1556  | 1556 | 1556  | 1556 |      |
| 5°   | 1556 | 1550  | 1534 | 1546  | 1543 | 148  |
| 15°  | 1482 | 1473  | 1453 | 1459  | 1452 | 417  |
| 25°  | 1341 | 1329  | 1304 | 1306  | 1304 | 617  |
| 35°  | 1157 | 1142  | 1118 | 1109  | 1102 | 722  |
| 45°  | 941  | 931   | 908  | 892   | 886  | 727  |
| 55°  | 712  | 703   | 686  | 668   | 660  | 637  |
| 65°  | 480  | 471   | 456  | 443   | 436  | 475  |
| 75°  | 251  | 248   | 241  | 232   | 235  | 268  |
| 85°  | 61   | 60    | 58   | 54    | 52   | 68   |
| 90°  | 1    | 7     | 19   | 18    | 18   | 5    |
| 95°  | 28   | 33    | 34   | 34    | 33   | 31   |
| 105° | 115  | 116   | 118  | 118   | 118  | 121  |
| 115° | 214  | 217   | 216  | 215   | 214  | 211  |
| 125° | 311  | 315   | 314  | 312   | 312  | 278  |
| 135° | 402  | 408   | 409  | 408   | 407  | 311  |
| 145° | 488  | 492   | 495  | 495   | 493  | 305  |
| 155° | 558  | 559   | 561  | 564   | 562  | 257  |
| 165° | 607  | 606   | 606  | 610   | 607  | 171  |
| 175° | 631  | 630   | 629  | 632   | 629  | 60   |
| 180° | 632  | 632   | 632  | 632   | 632  |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1556.4 | 1556.4 | 1556.4 | 1556.4 | 1556.4 |
| 2.5°   | 1565.5 | 1558.0 | 1541.5 | 1556.4 | 1553.6 |
| 5°     | 1556.4 | 1550.5 | 1534.0 | 1545.9 | 1543.1 |
| 7.5°   | 1545.9 | 1537.0 | 1520.5 | 1532.6 | 1529.6 |
| 10°    | 1529.6 | 1519.1 | 1501.2 | 1513.1 | 1508.6 |
| 12.5°  | 1507.0 | 1498.1 | 1480.2 | 1487.7 | 1484.6 |
| 15°    | 1481.6 | 1472.7 | 1453.2 | 1459.2 | 1451.8 |
| 17.5°  | 1450.2 | 1441.3 | 1421.8 | 1429.2 | 1421.8 |
| 20°    | 1415.7 | 1406.8 | 1385.9 | 1390.3 | 1384.5 |
| 22.5°  | 1381.4 | 1367.9 | 1348.4 | 1348.4 | 1345.4 |
| 25°    | 1340.9 | 1329.0 | 1303.6 | 1306.5 | 1303.6 |
| 27.5°  | 1296.0 | 1285.5 | 1266.2 | 1261.7 | 1254.3 |
| 30°    | 1251.2 | 1239.2 | 1216.8 | 1212.3 | 1206.3 |
| 32.5°  | 1203.3 | 1194.4 | 1170.4 | 1161.4 | 1155.3 |
| 35°    | 1156.9 | 1142.0 | 1118.0 | 1109.0 | 1101.5 |
| 37.5°  | 1104.5 | 1091.0 | 1067.0 | 1056.6 | 1049.1 |
| 40°    | 1050.7 | 1038.6 | 1014.6 | 1001.3 | 995.3  |
| 42.5°  | 998.3  | 986.2  | 962.4  | 947.3  | 938.4  |
| 45°    | 941.4  | 931.0  | 908.4  | 892.1  | 886.0  |
| 47.5°  | 886.0  | 875.5  | 851.6  | 835.1  | 826.2  |
| 50°    | 827.6  | 820.1  | 799.2  | 778.2  | 770.7  |
| 52.5°  | 770.7  | 760.3  | 740.9  | 724.4  | 713.9  |
| 55°    | 712.5  | 703.4  | 685.5  | 667.5  | 660.1  |
| 57.5°  | 654.0  | 646.6  | 627.0  | 609.1  | 603.1  |
| 60°    | 595.6  | 589.7  | 568.8  | 552.3  | 547.8  |
| 62.5°  | 538.8  | 528.3  | 513.4  | 498.4  | 492.4  |
| 65°    | 480.5  | 471.4  | 456.5  | 443.0  | 435.6  |
| 67.5°  | 420.6  | 413.0  | 399.7  | 389.2  | 383.2  |
| 70°    | 365.2  | 359.2  | 345.7  | 335.2  | 329.3  |
| 72.5°  | 308.4  | 302.3  | 294.9  | 284.4  | 279.9  |
| 75°    | 251.4  | 248.5  | 240.9  | 232.0  | 235.0  |
| 77.5°  | 200.5  | 194.5  | 191.5  | 187.0  | 182.6  |
| 80°    | 149.7  | 148.1  | 145.1  | 140.7  | 137.7  |
| 82.5°  | 101.8  | 101.8  | 100.4  | 94.3   | 94.3   |
| 85°    | 61.3   | 59.9   | 58.4   | 53.8   | 52.4   |
| 87.5°  | 27.0   | 24.0   | 21.0   | 16.5   | 14.9   |
| 90°    | 0.6    | 6.9    | 18.7   | 17.5   | 18.1   |
| 92.5°  | 11.8   | 16.0   | 16.6   | 17.2   | 17.2   |
| 95°    | 27.8   | 33.2   | 34.1   | 34.1   | 33.2   |
| 97.5°  | 46.3   | 51.3   | 53.4   | 53.4   | 53.4   |
| 100°   | 67.7   | 72.1   | 73.6   | 73.6   | 73.0   |
| 102.5° | 90.2   | 93.4   | 95.5   | 96.1   | 95.5   |
| 105°   | 114.8  | 116.3  | 117.5  | 118.4  | 118.4  |
| 107.5° | 139.2  | 141.5  | 141.5  | 141.9  | 139.2  |
| 110°   | 162.9  | 165.9  | 165.9  | 165.9  | 164.4  |



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**CANDELA DISTRIBUTION (continued):**

|        | 0°    | 22.5° | 45°   | 67.5° | 90°   |
|--------|-------|-------|-------|-------|-------|
| 112.5° | 188.4 | 191.6 | 191.1 | 189.5 | 188.4 |
| 115°   | 213.6 | 216.6 | 215.7 | 215.1 | 213.6 |
| 117.5° | 238.6 | 242.8 | 240.1 | 238.6 | 237.0 |
| 120°   | 263.7 | 267.9 | 263.7 | 263.7 | 262.0 |
| 122.5° | 286.6 | 291.9 | 289.3 | 287.8 | 286.6 |
| 125°   | 310.6 | 315.4 | 313.9 | 312.2 | 311.6 |
| 127.5° | 334.1 | 340.0 | 337.9 | 335.6 | 334.1 |
| 130°   | 356.0 | 362.9 | 361.9 | 360.8 | 358.7 |
| 132.5° | 380.6 | 386.0 | 386.3 | 383.7 | 382.1 |
| 135°   | 401.8 | 407.7 | 408.8 | 408.3 | 406.7 |
| 137.5° | 425.4 | 430.2 | 431.2 | 430.8 | 428.5 |
| 140°   | 446.2 | 451.0 | 453.7 | 453.7 | 451.6 |
| 142.5° | 467.6 | 472.3 | 473.9 | 474.4 | 472.3 |
| 145°   | 487.8 | 491.6 | 494.7 | 495.2 | 493.1 |
| 147.5° | 505.9 | 510.7 | 513.0 | 513.9 | 511.8 |
| 150°   | 524.6 | 527.8 | 529.9 | 531.6 | 529.9 |
| 152.5° | 541.2 | 544.4 | 547.1 | 549.2 | 547.1 |
| 155°   | 557.8 | 559.3 | 561.0 | 563.7 | 562.0 |
| 157.5° | 572.1 | 573.2 | 574.2 | 578.0 | 575.3 |
| 160°   | 584.9 | 586.0 | 586.6 | 589.8 | 587.5 |
| 162.5° | 596.7 | 596.7 | 597.2 | 600.9 | 598.2 |
| 165°   | 606.8 | 606.2 | 606.2 | 610.0 | 607.4 |
| 167.5° | 615.9 | 614.2 | 614.2 | 618.0 | 615.4 |
| 170°   | 622.8 | 621.3 | 620.7 | 624.5 | 621.3 |
| 172.5° | 627.6 | 626.0 | 625.5 | 629.3 | 626.0 |
| 175°   | 631.4 | 629.9 | 628.7 | 632.5 | 629.3 |
| 177.5° | 633.5 | 632.0 | 630.8 | 634.0 | 630.8 |
| 180°   | 632.5 | 632.5 | 632.5 | 632.5 | 632.5 |

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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 | 10.83            | 11.90 | 11.61 | 12.69 | 13.66 | 10.39          | 11.45 | 11.16 | 12.25 | 13.22 |
|                 | 3H   | 12.50            | 13.46 | 13.29 | 14.26 | 15.26 | 12.01          | 12.97 | 12.80 | 13.77 | 14.77 |
|                 | 4H   | 13.10            | 14.00 | 13.90 | 14.81 | 15.82 | 12.60          | 13.51 | 13.41 | 14.32 | 15.33 |
|                 | 6H   | 13.50            | 14.34 | 14.32 | 15.16 | 16.18 | 13.00          | 13.84 | 13.82 | 14.66 | 15.68 |
|                 | 8H   | 13.61            | 14.41 | 14.44 | 15.25 | 16.27 | 13.11          | 13.90 | 13.94 | 14.75 | 15.77 |
|                 | 12H  | 13.67            | 14.42 | 14.50 | 15.26 | 16.31 | 13.16          | 13.91 | 13.99 | 14.75 | 15.80 |
| 4H              | 2H   | 11.31            | 12.22 | 12.12 | 13.03 | 14.04 | 10.96          | 11.86 | 11.77 | 12.68 | 13.69 |
|                 | 3H   | 13.19            | 13.95 | 14.01 | 14.79 | 15.82 | 12.78          | 13.54 | 13.60 | 14.39 | 15.41 |
|                 | 4H   | 13.91            | 14.60 | 14.75 | 15.44 | 16.50 | 13.49          | 14.17 | 14.32 | 15.02 | 16.07 |
|                 | 6H   | 14.43            | 15.03 | 15.28 | 15.90 | 16.96 | 14.00          | 14.60 | 14.85 | 15.47 | 16.52 |
|                 | 8H   | 14.59            | 15.14 | 15.44 | 16.01 | 17.08 | 14.15          | 14.70 | 15.00 | 15.57 | 16.64 |
|                 | 12H  | 14.67            | 15.17 | 15.54 | 16.05 | 17.13 | 14.22          | 14.72 | 15.09 | 15.60 | 16.68 |
| 8H              | 4H   | 14.12            | 14.68 | 14.97 | 15.54 | 16.61 | 13.74          | 14.30 | 14.60 | 15.16 | 16.23 |
|                 | 6H   | 14.75            | 15.21 | 15.63 | 16.12 | 17.19 | 14.37          | 14.83 | 15.25 | 15.74 | 16.81 |
|                 | 8H   | 14.97            | 15.38 | 15.87 | 16.28 | 17.37 | 14.58          | 14.99 | 15.47 | 15.89 | 16.98 |
|                 | 12H  | 15.11            | 15.47 | 16.01 | 16.36 | 17.51 | 14.70          | 15.06 | 15.59 | 15.95 | 17.09 |
| 12H             | 4H   | 14.11            | 14.61 | 14.99 | 15.50 | 16.58 | 13.75          | 14.25 | 14.62 | 15.13 | 16.21 |
|                 | 6H   | 14.78            | 15.19 | 15.68 | 16.09 | 17.18 | 14.41          | 14.82 | 15.30 | 15.72 | 16.81 |
|                 | 8H   | 15.03            | 15.39 | 15.93 | 16.28 | 17.43 | 14.65          | 15.01 | 15.55 | 15.90 | 17.04 |